

Interop preview Extreme, Shoreline to launch 10G Ethernet and VoIP gear, respectively, at N+1 next month. **PAGE 12.**



VeriSign's view Stratton Sclavos, CEO of the PKI pioneer, explains how VeriSign's acquisitions have panned out. **PAGE 18.**

NetworkWorld

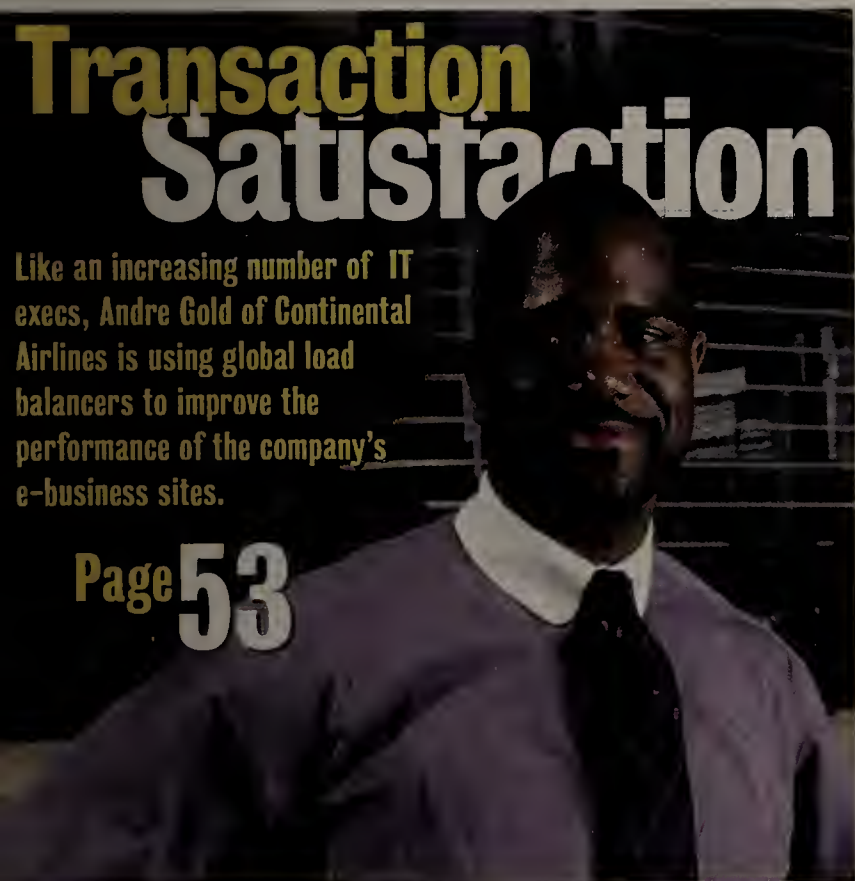
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April 15, 2002 ■ Volume 19, Number 15

Transaction Satisfaction

Like an increasing number of IT execs, Andre Gold of Continental Airlines is using global load balancers to improve the performance of the company's e-business sites.

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PAM FRANCIS

IP telephony talk zeroes in on SIP

■ BY PHIL HOCHMUTH

SEATTLE — As voice over IP gains momentum in large organizations, experts say forward-thinking network executives should familiarize themselves with three letters: S, I and P.

Session Initiation Protocol was on the minds of customers, ana-

lysts and the vendors who were pushing a lineup of new SIP-related products at the Voice on the Net show last week.

SIP is an Internet Engineering Task Force protocol, similar in format to HTTP, used in applications to establish and terminate communication sessions over IP

See SIP, page 16

Put to the test

New threats force intrusion-detection vendors to rearm.

■ BY ELLEN MESSMER

Intrusion-detection systems work just fine when it comes to spotting and clamping down on attacks that have been seen before, but security experts warn that a new breed of stealthy network-attack techniques could run roughshod over today's IDS devices.

Experts are increasingly concerned about newer threats such as the so-called polymorphic buffer overflow, in which a person alters the attack's shell code or encrypts it to slip by an IDS. Some analysts contend that signature-based detection systems are doomed unless vendors adapt to changing conditions.

"The IDS vendors will have to graft on anomaly and behavior-based detection or they will die," says Ed Skoudis, vice president of



“The IDS vendors will have to graft on anomaly and behavior-based detection or they will die.”

Ed Skoudis

Vice president of ethical hacking, Predictive Systems

ethical hacking at consultancy Predictive Systems.

The first evidence of how a polymorphic buffer-overflow attack might work came last year with an online tool called ADMutate that can take an attack shell code and subtly transform it. That way, the attack code looks different from the known signature but is functionally equivalent.

As it hits the target machine it reassembles, having eluded the IDS. The ADMutate mutation engine is the first of its kind.

While polymorphic attack techniques currently might not be in widespread use, they are a disturbing prospect “because when you can mutate that code in any way, you make it difficult to detect

See Attacks, page 76

New formula for apps access

Web services help chemical company send catalog updates in real time.

■ BY JOHN FONTANA

WebServices
EARLY ADOPTERS
First in a three-part series

KINGSPORT, TENN. — In his role as “hype buster” for Eastman Chemical, Carroll Pleasant has been called upon to put Web services under his magnifying glass. So far, he likes what he sees, though concerns about performance and security have him moving cautiously.

Eastman is trying out Web services to give partners and customers speedier and more targeted access to applications, such as a product catalog of more than 400 chemicals, fibers and plastics. If Web services prove successful, the company will offer a range of them in hopes of generating new revenue.

the idea that you can wrap up intellectual property in an object that can actually respond to different requests. It is not just: ‘Send all the data you’ve got.’”

He compares Eastman's Product Catalog Web Service to a dictionary service on the Internet. “Would you rather have a service where I download the whole dictionary to you, or would you

“Web services are an [application] interface technology for us,” says Pleasant, Eastman's principal emerging technologies analyst. “What's different is

■ Industry group seeks to define Web services, see page 76.

See Web services, page 74



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intuitive information security

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Global load balancers can boost the performance of e-business sites. **Page 53.**

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RouteScience's PathControl wins a World Class Award for its ability to optimize Internet routing. **Page 57.**

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Forums

Time Warner to bandwidth hogs: Pay up

All-you-can-eat bandwidth is a thing of the past if you're a Time Warner cable modem customer. Is the end of unlimited use corporate greed or fair play? Share your thoughts.

DocFinder: 8935

Verizon wish list

Before the carrier gets too focused on long-distance, customers want Verizon to address some local issues first. What would you put at the top of your Verizon wish list?

DocFinder: 8937

Interactive

Call for entries

Know someone who has had an outstanding career, has led an innovative program or is a rising star? Enter them into the Network Professional Association's inaugural Awards for Professionalism program.

DocFinder: 8938

Fusion widgets

Get free tools to put Fusion to work for you, everything from a spyware detector to search tools.

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Columnists

Compendium

Web page delivery
Fusion Executive Editor Adam Gaffin tells you how you can get Web pages sent to your in-box via e-mail commands.

DocFinder: 8940

Help Desk

NetWare, SLP and IP
Columnist Ron Nutter offers a reader advice on using Service Location Protocol with NetWare.

DocFinder: 8941

Home Base

Do parents get all the perks?
Columnist Jeff Zbar has advice for managers on how to balance their telework programs equally.

DocFinder: 8843

Seminars and Events

Wireless ready?

Is your network ready for wireless? Find out with our free Tech Update "Integrating and managing wireless in your network" event. **DocFinder: 8546**

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New

Bits

Symmetrix Remote Data Facility business-continuity software; its TimeFinder remote storage software; and data migration and mainframe storage patents, the company said. Hitachi, based in Tokyo, but with offices in California, was not immediately available for comment. EMC says it has been negotiating with Hitachi for four years on the matter.

CA sells off interBiz products

■ Computer Associates last week announced it would sell its interBiz supply-chain management, financial management and human resource management product lines to SSA Global Technologies, an enterprise resource planning software and services provider in Chicago. SSA says it will continue to support and update the CA products, and plans to immediately integrate them with SSA's collaborative commerce, customer relationship management and supplier relationship applications.

Terms of the deal were not disclosed. CA says interBiz products generated \$64 million in revenue for the nine months ended Dec. 31, and that 725 employees were transferred to SSA as part of this transaction.

The Good The Bad The Ugly



Back to IT. The bursting of the dot-com and telecom industry bubbles has its benefits for enterprise network shops, according to industry watcher Nick Lippis (www.lippis.com): "With the influx of technical talent heading back to enterprise positions, so too will network intelligence and innovation."



Longing for Bob and Craig?

The state of Enterasys Networks these days may have employees and customers longing for the prosperous and zany days of former top executives Craig Benson and Bob Levine. The Cabletron spinoff last week announced plans to slash its workforce by 30% to 1,700, after announcing the week before that CEO Henry Fiallo was stepping down amid an anticipated revenue dip. ➤



DARREN GYI



Microsoft muddle.

Four months before Microsoft's new software licensing plan goes into effect, nearly half of 1,400 IT managers surveyed said they lack the necessary funds to upgrade to the new plan and that confusion over licensing will delay their software upgrade processes, according to a study conducted by Information Technology Intelligence and Sunbelt Software.

Funk acknowledges vulnerability

■ Funk Software last week disclosed security vulnerabilities in its Proxy Remote Control software, which is used by an administrator in a help-desk environment to take remote control of a user's Windows-based machine. Funk urged customers to upgrade to a new version of its latest release, Proxy v3.09a, to correct the problems. The vulnerabilities could let unauthorized users obtain Proxy Host passwords or change configuration settings, default file systems and registration settings. The upgrade to Proxy Remote Control is available at www.funk.com/subsections/tec_proxy.asp. (For more Funk-related news, see page 30.)

Heavyweights push security spec for Web services

■ IBM, Microsoft and VeriSign last week published a Web services security specification they hope will fill what has become the most glaring hole in the nascent technology. Making the announcement at Microsoft's annual Tech Ed conference, the three companies said the specification, called WS-Security, outlines how to integrate disparate security systems such as Kerberos or public-key infrastructure using a set of extensions to the Simple Object Access Protocol. The initial specification includes two base extensions and the trio plans to develop six others. In essence, WS-Security will let Web services pass secure and signed messages, a process that today requires a patchwork of proprietary technology.

Security breaches becoming more costly

■ Network-based security breaches are taking an increasingly heavy toll on corporations and government agencies, according to an annual survey by the Computer Security Institute and the FBI. The poll of 503 security professionals suggests that organizations suffered about \$456 million in financial losses last year because of security incidents that include theft of proprietary information or fraud, up from \$378 million in 2000. About three-quarters of respondents said their external Internet connection was a point of attack, while 33% said their internal networks were attacked.

EMC files patent suit against Hitachi

■ Alleging that Hitachi is infringing on six of its patents, EMC last week filed a suit in U.S. District Court seeking damages and also filed a complaint with the International Trade Commission asking the body to block import of the infringing products into the U.S. The complaints, which EMC lodged against Hitachi and the company's Hitachi Data Systems division, concern patents covering the company's

European Parliament nixes Web blocking

■ The European Parliament voted against blocking access to Web sites as a way of regulating content on the Internet, instead pushing self-regulation and filter and rating systems. The vote — 460 in favor, zero against and three abstentions — on Thursday adopted a report on the protection of minors and human dignity that addresses many media, including the Internet. The Parliament's report is not a legislative document, but is in response to a previous evaluation report by the European Commission. The European Internet Services Providers Association, which has always been in favor of self-regulation, applauded the decision. EuroISPA called blocking a "technically disastrous solution" that also creates "free speech and democratic concerns."

ICANN warns of domain-name scam

■ The Internet Corporation for Assigned Names and Numbers is warning of a swindle by an organization claiming to be an approved domain-name dispute solver. ICANN, the organization that oversees the Internet's addressing system, said last week it has received many reports of domain name registrants receiving mailings from an entity calling itself XChange Dispute Resolution and claiming to be an ICANN-authorized arbitrator in domain-name dispute cases, which it is not. In the mailing, XChange Dispute Resolution says it received a domain dispute-resolution complaint and asks the domain name holder to mail a deposit of between \$250 and \$1,250 to defend ownership of a domain. If the recipient takes no action, rights to the domain are forfeited, the mailing says, according to ICANN.

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AT&T airs converged network upgrades

■ BY DENISE PAPPALARDO

SEATTLE — AT&T unveiled enhancements to its voice-over-data services last week that expand their reach to ATM customers and more international locations.

The carrier now offers the same voice-over-data support to ATM customers that it has offered IP and frame relay users for more than a year. AT&T also announced that customers now can set up hybrid voice and data networks if they have a combination of dedicated ATM, frame relay and Internet access connections. Previously, customers couldn't interconnect voice traffic between varied network types.

The carrier has deployed firewalls between its data networks to support the secure hand-off of voice traffic, says Joe Aibinder, director of voice-over-IP business

See AT&T, page 76

NetScreen bolsters security wares

■ BY TIM GREENE

SUNNYVALE, CALIF. — NetScreen Technologies is setting the stage to extend the protection offered by its firewall/VPN line through two new high-speed devices that can simplify network management thanks to their potential support for intrusion detection and virus scanning.

NetScreen-5200 and NetScreen-5400 come with firewall and VPN software and can be programmed to support other security applications, the company says. The 5400 — with firewall speeds as high as 12G bit/sec and VPN speeds up to 6G bit/sec — surpasses performance claims made by any other vendor.

NetScreen says it plans to add applications to the platform, and intrusion-detection and antivirus software are leading contenders.

By lumping together security functions in the same device, corporate security personnel limit the number of devices they must manage, saving administrative time and saving space and power, says Joel Conover, an analyst with Current Analysis.

A host of newcomers such as CrossBeam, Nexsi and Tipping-Point Technologies are integrating these multiple security features in a single chassis, and Check Point Software partners with other vendors to integrate intrusion detection with its firewall/VPN software. But this is the first time an established, strictly firewall/VPN vendor has redesigned its hardware to support other security features, Conover says.

Incorporating more functions into VPN/firewall devices might not be the way to go for everyone, says Jeff Dell, a NetScreen customer who has not used the 5200 or 5400. "I like to keep things separate," he says, noting that, for instance, he might want to update an antivirus database nightly, but without disturbing the firewall.

He says he also would be concerned whether the packet-inspection engine on the device would be able to parse packets deeply enough to effectively detect viruses. NetScreen says its new capabilities will enable inspecting all the way

Top speed

NetScreen's 5200 and 5400 VPN/firewall gateways claim the fastest speeds.

- NetScreen 5200: 4G bit/sec firewall*; 2G bit/sec Triple-DES encryption.*
- NetScreen 5400: 12G bit/sec firewall*; 6G bit/sec Triple-DES encryption.

*All large packets.



well-respected Snort intrusion-detection freeware.

From a firewall and VPN point of view, the two new models boost the capacity to support virtual firewalls, which are separately configurable policy sets within a single firewall device. NetScreen's previously largest box, NetScreen-1000, supported 250 virtual firewalls, while the 5200 and 5400 support 500.

The 5200 can be configured with either eight Gigabit Ethernet ports or 24 10/100M bit/sec Ethernet ports. The 5400 supports either 26 Gigabit Ethernet or 78 10/100 ports. Initially, the devices can be paired so if one fails the other takes over.

NetScreen says it reaches increased speeds with the 5200 and 5400 because of new processors called GigaScreen II, each of which handles 2G bit/sec firewall and 1G bit/sec VPN processing, assuming only large packets.

NetScreen-5200 is available now and costs \$99,000. NetScreen-5400 will be available this fall, and its price has not been set. ■

into packet payloads. Dell also says that if NetScreen decides to write its own intrusion-detection software, it would have to convince users it is on par with the

ActiveLane builds on Microsoft VPN technology

■ BY TIM GREENE

DUBLIN, CALIF. — If you have thought of using the remote-access VPN capabilities imbedded in Windows 2000 Server but backed off because they were too complex, ActiveLane's new offering might be for you.

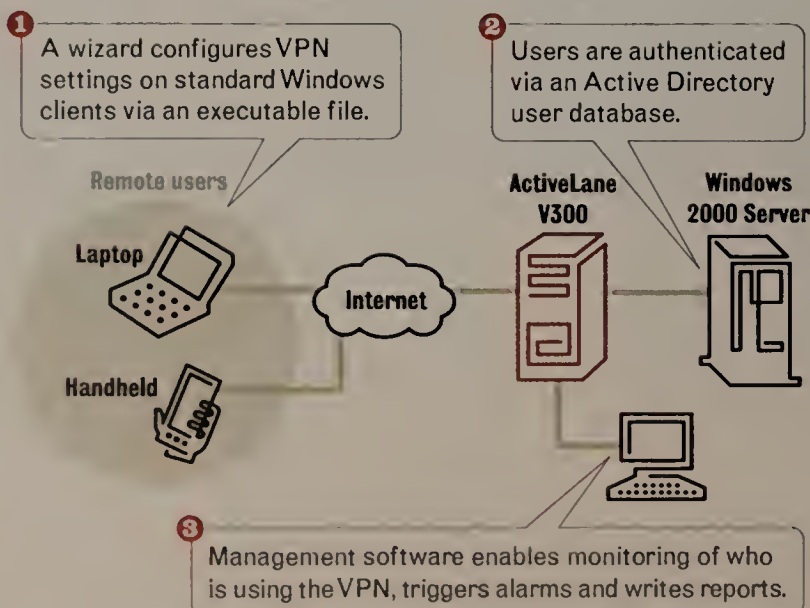
This week, the start-up will introduce a hardware and software package called V3000 VPN Server Appliance designed to streamline the process of setting up Windows-based VPNs.

The V3000 appliance is based on standard Intel server hardware and runs a version of Win 2000 Server with the services not essential to VPN support removed. Also included in the device, which sits between the Internet and Windows servers, is a dedicated processing card to speed VPN encryption.

Using ActiveLane's software tools, customers can set up the server side of a VPN connection in 15 minutes, about a

Outdoing Microsoft?

ActiveLane's V3000 appliance provides an alternative for setting up Windows-based VPNs. The box incorporates a streamlined version of Windows 2000's VPN technology and tools to simplify configuration and management.



half-hour faster than it takes to do it with the standard Microsoft server, says V3000 user Micheal Bach, information systems manager at Atoga Systems of Fremont, Calif., which makes optical network gear.

The real timesaver, though, comes on the client side. An ActiveLane installation wizard sets up an executable file that configures Windows PC and handheld software so that client devices can connect to a VPN, Bach says. Rather than configuring the client manually, end users download the file and execute it, and their machine connects to the VPN. "Without [the executable file] we sent users an eight-page document with pictures to set the client up themselves, and they still screwed it up," Bach says.

Once a VPN tunnel is set up, users enter their network identification and password, which is checked against information in Microsoft's Active Directory databases. Compatibility with Active Directory eliminates the need to maintain a separate authorization database for the VPN.

The \$12,000 package also features software that can trigger alarms, generate standard and custom reports on current

and historical use by individuals.

The appliance is configured via a browser interface and supports 1,000 concurrent connections. Because it relies on Microsoft VPN software, the ActiveLane 3000 supports Point-to-Point Tunneling Protocol and Layer 2 Tunneling Protocol/IP Security VPN tunnels.

ActiveLane competes against the likes of Neoteris and Netilla Networks, which make secure, Internet-based remote-access gear that relies on standard Web browser security rather than special client software, says Robert Lonadier, president of consulting firm RCL and Associates.

The company also makes firewall, caching and storage equipment. Founders include Ravi Lingkar, the former vice president of engineering for McAfee and former director of engineering at Network Associates. ■

Correction

■ In the story "Gupta touts Web services" (April 8, page 31), Keynote Systems CEO Umang Gupta should have been listed as the founder of what is now Centura Software.

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Extreme joins the 10Gig Ethernet fray

■ BY PHIL HOCHMUTH

Extreme Networks will make its first official foray into the 10G Ethernet market this week when it announces a 10G bit/sec module for its BlackDiamond Switch.

The module will provide quality-of-service (QoS) and traffic-shaping features, and the ability to move Ethernet packets at 10,000M bit/sec, the company says.

The blade could help corporate IT users alleviate data center bottlenecks by linking switches with high-speed interconnects, the vendor adds.

Also being announced this week is new IP telephony gear from Shoreline Communications, which is expanding IP phone and voice-over-IP protocol support on the company's distributed VoIP system. The new Shoreline and Extreme products also will be deployed as the voice and data infrastructure at the NetWorld+Interop 2002 show next month in Las Vegas (see

story, below).

Extreme's 10G Ethernet module will be a single-port, one-slot blade for its BlackDiamond chassis switch. While Extreme is one of the last large Ethernet switch players to announce a 10 Gigabit module — Enterasys Networks, Cisco, Riverstone Networks, Foundry Networks, Nortel and Avaya have announced products — the company says its offering will have wire-rate QoS capabilities, which competing 10G Ethernet products lack.

"I could see us using the 10G [blade from Extreme] to interconnect our data center switches," says Tony Crognale, a network technician with Scottsdale Insurance in Arizona, which has more than 30 Extreme BlackDiamond switches deployed. "10G would let us free up some of our trunked Gigabit ports and just hook our backbone," with a single fiber connection, he says.

10G Ethernet is not urgent at the firm, Crognale says, but new projects, such as IP video to the desk-

top and the move to a "paperless" office continues to increase the company's bandwidth usage.

Extreme says it is addressing an area of the nascent 10G Ethernet



market that has been overlooked — the ability to traffic-shape packets moving at 10,000M bit/sec without latency or delay.

Extreme's blade will have a distance limitation of 6.2 miles over single-mode fiber-optic cable — multimode fiber will not be supported in the first module release. The module will be available in the summer for about \$60,000.

Meanwhile, Shoreline will release its Shoreline4 IP telephony system with expanded support for the Media Gateway Control Protocol (MGCP) IP phones and the use of the Session Initiation Protocol (SIP) as the base tech-

nology for IP call control among Shoreline devices. MGCP and SIP are protocols developed by the International Telecommunications Union and Internet Engineering Task Force, respectively, for setting up and controlling packet telephony traffic.

Shoreline's offering is a hybrid IP/analog phone system where call control and switching is distributed throughout a LAN. ShoreGear VoIP switches attach to a LAN switch and support digital phone handsets that can be reused from older systems or purchased new from Shoreline. In Shoreline4, the company is replacing a proprietary interswitch control protocol with SIP, which Shoreline says will open the system more to supporting SIP-based IP devices or applications such as Windows Messenger in Windows XP. MGCP phone support will let IP phones be used on the Shoreline system for the first time.

Shoreline has certified Polycom's SoundPoint 500 IP phones

on Shoreline4.

Shoreline competes with 3Com, Cisco, Avaya, Alcatel, Nortel and Mitel, among others in the mid-range VoIP market for businesses with 100 to 5,000 phones.

Experio Solutions, a technology-integration company in Dallas, installed Shoreline's system last year. The firm has 19 offices nationwide and approximately 800 employees on the system, which has saved the company on long-distance charges and helped improve productivity, says Michael Shisko, the company's IT director.

"People love the productivity enhancements you can get on the [Shoreline] system by using the PC and phone together," Shisko says. Experio employees can click on a name in their Microsoft Outlook contact databases and that sends a signal to the Shoreline system to call the contact on the user's desktop phone. The company also has an online corporate phone directory that can be used to dial other employees from the PC.

Because the Shoreline devices are deployed in a distributed configuration, the company does not have to worry about a significant loss of phone service in the case of one device failing, Shisko says. The company also saves 80% on what it used to pay on long-distance by running its interoffice voice traffic across the company's data VPN, provided by Qwest Communications, he adds. ■

Convergence in action

Shoreline, Extreme put the interoperability in Interop at upcoming N+I show.

In addition to showing off new voice and data products at the NetWorld+Interop 2002 show May 6-10 in Las Vegas, Extreme Networks and Shoreline Communications will put their gear to work.

10G Ethernet switches from Extreme and IP voice gear from Shoreline will be two of the main technologies used as the voice and data foundation for eNet, the converged network that will run the show.

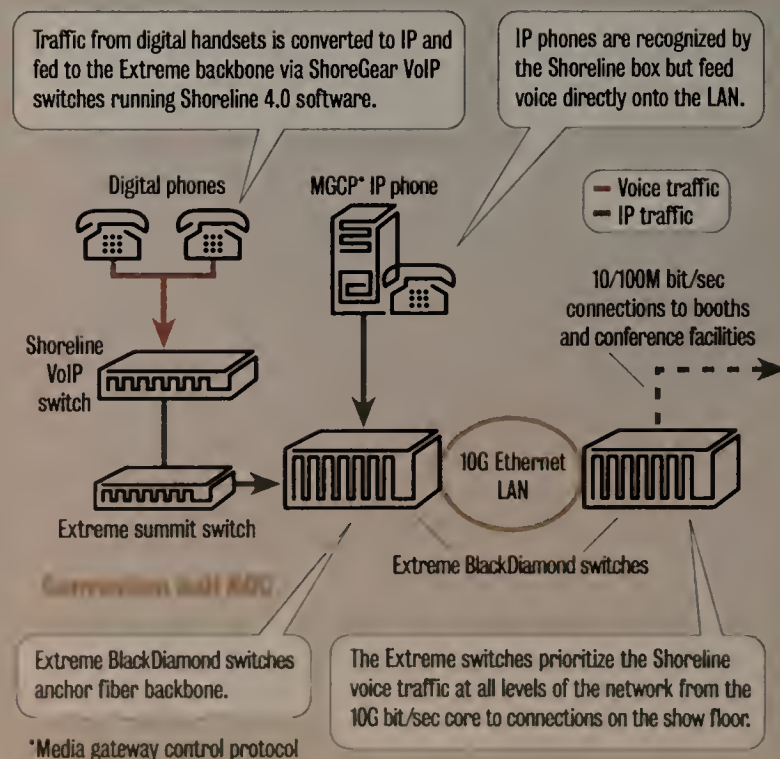
Extreme will deploy five BlackDiamond switches fitted with its new 10G Ethernet blade to serve as the network backbone for the show. The switches will be arranged in a ring topology in what Extreme and show organizers say will be the largest temporary deployment of live 10G Ethernet equipment and will support more than 8,000 nodes during the week. Extreme also will deploy its Alpine and Summit48 switches as a distribution layer of the network. Those boxes will have network runs to the show floor, and uplink to the 10G bit/sec backbone via Gigabit Ethernet connections.

The 30 ShoreGear distributed voice switches will provide the primary infrastructure for the show floor and for conference facilities such as seminar rooms and corporate meeting suites. Shoreline will deploy a mix of analog and IP phones throughout the convention center with all voice traffic linking over the Extreme backbone through the ShoreGear switches running Version 4.0 of Shoreline's operating system. Quality of service for the Shoreline voice traffic will be provided by the Extreme gear from an up to 10,000M bit/sec connections through the 10-Gigabit line.

—Phil Hochmuth

Sneak peek

New products from Extreme and Shoreline, among others, will help provide the LAN backbone and IP telephony infrastructure for the NetWorld+Interop show next month.

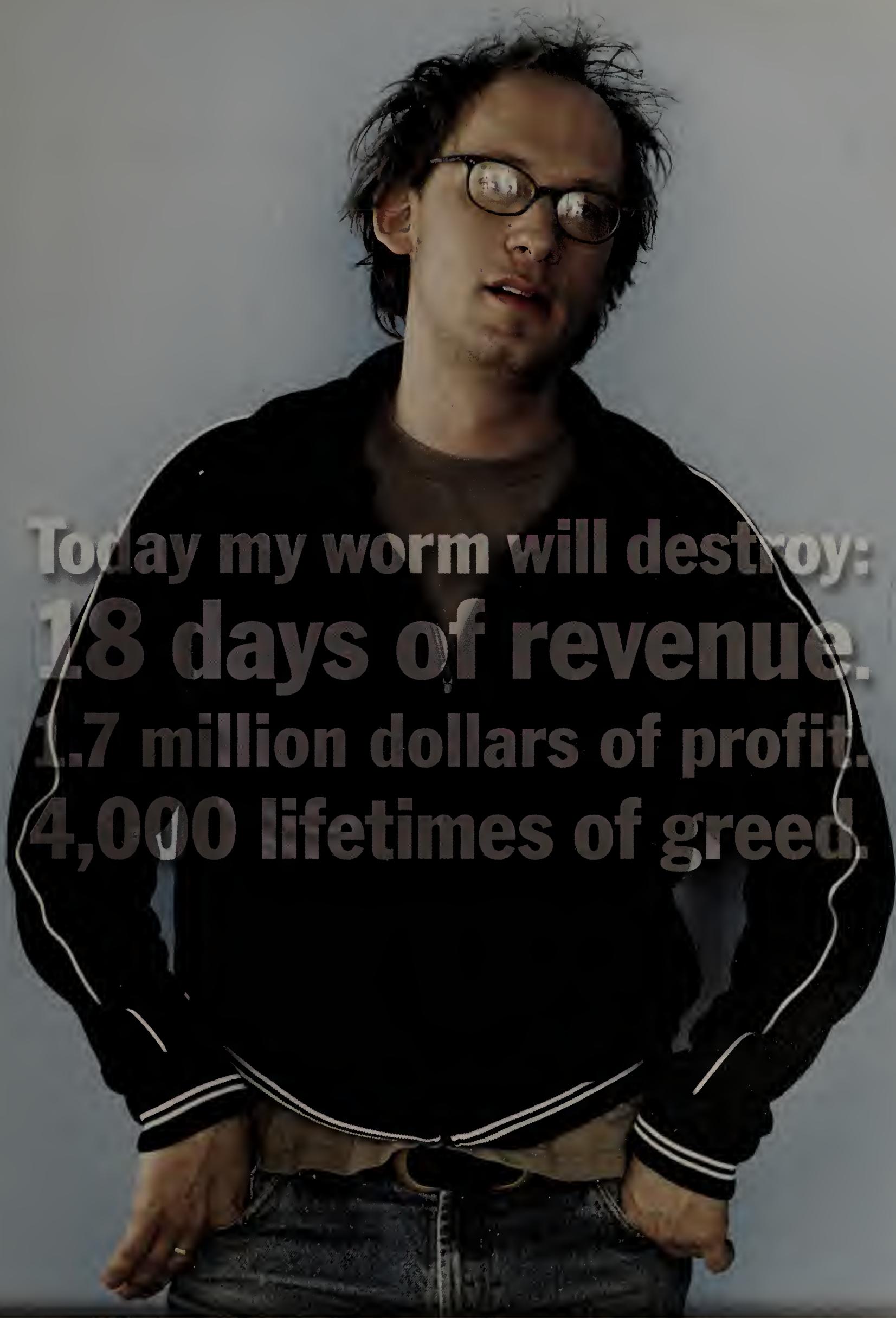


THIS WEEK'S QUESTION:

Cingular Wireless, the second-largest wireless company in the U.S., is the product of BellSouth merging its wireless business with what other Bell company?

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**INTERNET
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Microsoft talks up universal data system

Customers express concerns about plan that will rely heavily on next version of SQL Server.

■ BY JOHN FONTANA

NEW ORLEANS — Microsoft last week began to reveal an ambitious project to spread portions of its forthcoming database technology across its back-end infrastructure servers so companies can store data in an XML format and access it regardless of where it lives on a network.

At its Tech Ed 2002 conference, which drew 7,500 attendees, Microsoft laid out a concept for a universal file system that would rely heavily on technology from the next version of SQL Server, called Yukon. That technology allows for the storage of structured and unstructured data that can be accessed through a variety of devices and protocols.

Experts say the project opens all sorts of possibilities for IT shops to create data-driven applications and get control of exploding repositories of information.

Ultimately, Microsoft plans to create a universal file system that, in essence, makes back-end repositories, such as Windows file servers, Exchange Server and SQL Server, look like one virtual storage system for files and applications.

"You are talking about an intelligent engine that blurs the lines between a storage engine and an application engine," says Robert Ginsberg, CTO of Version 3, a software development firm. "There are a lot of things that get interesting programmatically, such as files that can update themselves based on alerts." But Ginsberg says Microsoft is taking on a huge effort that will require a new layer of security and present many complexities.

It's not a new concept, but bringing it to the PC is a huge innovation, Ginsberg says. IBM's AS/400 for years has used a single relational database to store everything and Oracle is developing a similar idea with its Internet File System.

XML is key to Microsoft's plan in that the technology makes it possible to create metatags — information about the stored data — that are used for more intelligent access to that data.

But moving to a universal file system won't come without a price, because corporations will eventually have to convert all their files to an XML format.

"I question the value of representing all data in XML," says an IT manager with

financial firm Merrill Lynch who asked not to be identified. "In some systems there is a vast amount of data that may not have to be represented in XML. A lot of the data that we share is in industry-specific formats. There is an issue here of practical implementation vs. theory."

However, Microsoft officials emphasized they are not creating a single data store, much like Oracle has with its database, but a single data format based on XML.

Microsoft has tried before to create a universal file system, but this time success is critical for its Web services initiative to take off. Web services technology is a set of XML-based protocols for integrating applications and back-end systems across networks.

Microsoft's effort will begin later this year with the first beta-test version release of Yukon. The server is expected to ship in the second half of next year. That will be followed by a version of Exchange, code-named Kodiak, that has Yukon technology at the heart of its data store. Yukon technology will then seep into other back-end systems.

"We have this great storage technology

that Microsoft owns, and we will share that technology with other products," says Paul Flessner, senior vice president of .Net enterprise servers.

He says Yukon technology will be part of a universal file system that Microsoft is developing. Other Microsoft technology, such as natural language access and synchronization, also could be used.

"We are trying to create a transparency to data," says Tom Rizzo, group product manager for SQL Server. "We want an easy way for the user to get data and not have to know or care where it came from."

Analysts say Microsoft is trying to solve one of the biggest problems companies face — getting control of their data.

"But the trail of crumbs to get to Yukon to fix this looks long and expensive," says Dana Gardner, an analyst with Aberdeen Group. "You are going to have to convert everything into XML." ■



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Caching vendors adding security features to gear

■ BY JENNIFER MEARS

Businesses looking to add another layer of protection beyond traditional firewalls will find a slew of new products from companies that are adding security features to their Web caching offerings.

Inktomi last week unveiled its Traffic Edge Security Edition software, which adds virus scanning, content filtering, and user authentication and access control to its caching software. Other vendors such as CacheFlow, Network Appliance and F5 Networks recently have added security features to their devices.

Analysts say they're seeing a trend among caching and Web acceleration companies to add more features to Web caches, enabling businesses to cache clean content, for example, or to speed up Secure Sockets Layer processing. The trend makes sense, analysts say, because of how caching and other Web acceleration products fit into current business networks. Caches typically sit behind a network firewall and store oft-accessed content so that repeated requests for a Web page can

Securing your cache

The days of the simple cache are over, and vendors recognize that their products need to do more than just store and forward content. Here's a look at some recent announcements:

F5 Networks — January

Partners with nCipher to integrate federally certified SSL acceleration capabilities into its Web acceleration devices.

CacheFlow — February

Tweaks its strategy to focus on security and announces a new caching device called Security Gateway, which combines Web acceleration, network protection and content control in one package.

Network Appliance — March

Partners with WebSense to add content filtering to its content delivery appliances.

Inktomi — April

Releases Traffic Edge Security Edition software, which adds content filtering, virus scanning, and user authentication and access control to its caching software.

be served locally from the cache, rather than having to be routed through the Internet again.

"These products are at a critical point in the network and they're a perfect location to add security functionality or just make sure that content that they're caching is secure," says Cindy Borovick, an analyst at IDC. "There is definitely

a need to make sure that these products complement a customer's security implementation. They're not replacing firewalls, but they're adding another layer of security to the network."

Frank Cabri, director of marketing at CacheFlow, which introduced its Security Gateway product earlier this year, says integrat-

ing security features into a cache is a perfect complement to firewalls, which scan packets as they enter the network. On the other hand, caches can look at the content that is being delivered and store the clean content.

By getting integrated security features within a Web cache, customers also get a single box to manage and configure, eliminating the headaches of running separate servers for caching and virus scanning. But when more than one function is performed on a single box, a single point of failure exists, so redundancy is important, analysts say.

A director of security at a financial services firm, who asked not to be named, says he uses Inktomi's caching software and is looking at the new security offerings because they provide the security he needs without the inconvenience.

"It's one device, one place to visit, one place to configure. Why do I want to go to three different boxes, and manage three different boxes and maintain configurations of three different boxes," he says. "Less is more. . . . Why should I maintain three different

vendor relationships when all I want to do is maintain one?"

What companies such as Inktomi need to do, he says, is ensure tight integration between their caching products and the additional features.

Inktomi says its caching software integrates with Symantec's CarrierScan Server antivirus software to protect business networks against viruses such as Nimda, which can be spread through infected Web pages.

Inktomi also has added authentication and access control to its caching software so that businesses can let employees access information such as 401(k) benefits from the Internet. The Traffic Edge Security Edition software lets businesses track who accesses information and restrict that access by linking to Lightweight Directory Access Protocol, for example, to maintain existing authentication policies.

Traffic Edge Security Edition software is available now and will also be available through Inktomi partners including Compaq, Dell, Hewlett-Packard, F5 and Fujitsu. Pricing for the software starts at \$5,000. ■

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SIP

continued from page 1

(see "The Scoop"). SIP applications include voice conversations, instant-message-style text chat and video. The technology is considered by some to be the successor to H.323, which is used as the base of a majority of IP voice products. One of SIP's draws is the promise of voice-over-IP (VoIP) interoperability among IP PBX, phone and gateway products, something lacking in current IP telephony systems.

SIP is being considered as a possible foundation for a voice network at Boeing, according to Michael McInnis, a network engineer at the Seattle aviation company.

"We're looking to migrate to voice over IP on a companywide basis," says McInnis, who attended Voice on the Net. "Some things I've seen here that can be done with SIP — like being able to organize a conference call through a [Microsoft] Outlook directory — sound pretty advanced — things I didn't even know could be done."

Boeing's voice network is built on five carrierscale, time division multiplexing-based Lucent 5ESS voice switches, which support a user base of 185,000 employees. The company also has pockets of

IP voice installed, with Cisco's CallManager IP PBX and about 2,000 phones deployed around the country. CallManager supports Cisco's Skinny Client Control Protocol and H.323, which will only go so far at Boeing, McInnis says.

"H.323 is not scalable enough to fit our needs, and it's also not as [voice and video convergent] as perhaps SIP is," he says. "We want to merge video with VoIP and we can't do that very well today on H.323."

The other factor that makes SIP appealing to McInnis is interoperability. "We're locked into the kinds of phones we can use with the Cisco [VoIP] product," McInnis says. "We want to get away from proprietary protocols and get into a more distributed model for telephony."

Although some call SIP the communications technology of the future, detractors say it will always be just that — an oft-talked-about but rarely deployed technology. A majority of enterprise VoIP gear is based on H.323 or Media Gateway Control Protocol, and SIP's installed base is relatively small compared with other VoIP protocols. Issues also remain with SIP, such as how to make it secure and interoperable with firewall and network address trans-

lation technology (NAT).

"I don't know of a huge amount of activity with SIP in the enterprise at this point," says Tom Valovic, an analyst with IDC. "Most [IP PBXs] deployed in enterprises are H.323-oriented. I don't really think SIP is playing large role with the exception of maybe a very large enterprise."

An IP voice system based on H.323 from Avaya is being installed at *The Seattle Times*.

"SIP is something we've been hearing about, and reading about," says Thomas Dunkerley, the newspaper's communications manager. However, his department is busy enough just getting IP voice off the ground, he adds. "SIP is something that probably won't affect us for a while."

At Avaya, product planners say they are ready to put SIP in the enterprise now, but will hold off on releasing SIP enterprise gear until users like Dunkerley start clamoring for it.

"We have [IP phones] that are SIP-capable," says Venkatesh Krishnaswamy, a VoIP product director with Avaya. "SIP has been tested on our enterprise IP telephony gear and is ready for the enterprise today, [but] we just aren't seeing a demand for it."

Nevertheless, VoIP equipment and services vendors were anxious to push their SIP-related product announcements at Voice on the Net.

Ingate introduced a firewall that the company says addresses a glaring security problem with SIP.

"You can't run SIP over most industry-standard firewalls," or between sites using NATs, says Steve Johnson, an Ingate vice president. The Ingate Firewall is a \$2,500 box that would sit at the edge of a WAN or Internet connection and provide firewall traffic filtering with support for SIP VoIP traffic. According to the company, the box supports SIP on dynamically allocated ports on the firewall, which can allow businesses to pass large volumes of calls through the box, as opposed to opening a specific port on a firewall for VoIP, which could leave a network open to intrusion.

Aravox and Cisco also have firewall products that can support VoIP and SIP.

■ Vendors continued to debate on IP PBXs at *Network World's* forum at Voice on the Net. **PAGE 48.**

Baan battling back

■ BY ANN BEDNARZ

ROME — In its ongoing effort to reclaim prominence in the e-business software market, Baan is introducing new products that will help customers squeeze inefficiencies out of their manufacturing processes.

Baan will unveil its new software lineup at its inForum user conference this week, which is expected to draw about 1,500 attendees, according to show organizers. On tap is the launch of Baan's retooled supply-chain management (SCM) suite, plus a preview of its forthcoming product life cycle management (PLM) suite, scheduled to be launched in June.

Once considered in the same league with top enterprise resource planning (ERP) vendors SAP, PeopleSoft and Oracle, Baan lost its momentum in 1999. After pulling in sales of \$176 million in the first quarter of 1999, Baan saw its revenue fall to less than \$80 million in the second quarter of 2000. Two CEOs came and left between July 1998 and January 2000, before British software maker Invensys acquired Baan in May 2000.

However, lately Baan has been trying to claw its way back. After eight consecutive unprofitable quarters, the company returned to profitability in the fourth quarter of 2000. Last year the company announced its iBaan family of Internet-based software, and this year it will build up its iBaan offerings for customers in six core industries: aerospace and defense; automotive; industrial machinery and equipment; electronics; logistics; and hybrid manufacturing.

See Baan, page 74

The Scoop

The news behind the news

The skinny on SIP

Session Initiation Protocol was developed in the mid-1990s by the Internet Engineering Task Force as a real-time communication protocol for IP voice, and has expanded into video and instant-messaging applications.

In voice, the protocol performs basic call-control tasks such as session set up and tear down, or the signaling for call initiation, dial tone and termination. SIP also controls other signaling for features such as hold, caller ID and call transferring. Its functions are similar to the Signaling System 7 protocol in standard telephony and H.323 or Media Gateway Control Protocol in IP telephony.

According to SIP proponents, the protocol can provide converged and unified communication services, such as voice and video conversations. Like HTTP, SIP is a text-based protocol, which makes it easy to write applications that incorporate the technology, observers say.

The SIP model for telephony puts most of the intelligence for call initiation features on the SIP device or user agent — such as an IP phone or a PC with voice or instant-messaging software. That lets SIP user agents provide more features and operate in more of a peer-to-peer fashion. The method is different from traditional telephony or H.323-based telephony, where "dumb" phones are deployed with most call processing and control intelligence residing in a centralized phone switch or server.

— Phil Hochmuth

Meet the new Baan

Baan is working on these new product suites:

iBaan for SCM: A new supply-chain management suite that boasts tighter integration between SCM modules so companies can deliver more accurate order-fulfillment guarantees.

SCM business unit: Baan is forming a new business unit in Atlanta around its SCM suite.

iBaan for PLM: A Web-based product lifecycle management suite, to be launched in June, includes new sourcing and shop-floor control modules for tracking product information through design, manufacturing, maintenance and retirement processes.

SAP adapter: The company will announce a prepackaged adapter for linking its products with software from SAP — a first for Baan, which previously has focused its integration efforts internally.

OpenWorld 3.0: A new version of Baan's XML-based integration framework, OpenWorld 3.0, will be unveiled at inForum.

Conferencing server vendor Dial demonstrated SIP-based features with an application that integrates voice and e-mail by allowing end users to start a conference call by clicking the names of conference participants in a Outlook directory. The eDial server then rings the participants' phones to join the call.

Microsoft demonstrated the combined IP voice, video and instant-messaging features of the SIP-based Windows Messenger application, released last fall as part of Windows XP.

"As of January, there were 17 million Windows XP clients out there ready to start using [voice over IP] minutes," says Jawad Khaki, a Microsoft vice president. "The

value of SIP to the enterprise in terms of new applications and enhanced productivity are more than enough to justify the infrastructure changes that will be necessary to support it."

Polycom and Pingtel were among IP vendors announcing hardware and software IP phones at the show.

Polycom is adding SIP to its SoundPoint 500 IP phone and Soundstation 3000 IP conference station. Pingtel introduced a software version of its IP phone that runs as a Windows desktop application and requires a standard headset accessory. ■



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Q & A

VeriSign CEO talks about strategy, integration

Public-key infrastructure pioneer VeriSign has acquired a dozen companies, including dot-com registry Network Solutions and telephony service provider Illuminet, over the past two years. VeriSign CEO Stratton Scavos recently spoke with Network World Senior Editor Carolyn Duffy Marsan about how he is merging these far-flung operations into a cohesive set of network services.

It's been two years since VeriSign bought Network Solutions for \$21 billion. Describe the progress in merging the companies and their products.

What we've been trying to build over the last seven years is a company that can provide a set of infrastructure services that everyone needs and that are an important component in doing commerce and communications over these networks. There are four building blocks to commerce in a physical or digital world: 1) Finding who to do business with; 2) Setting up a trusted relationship; 3) Communicating securely; 4) Transacting business.

Finding who to do business with [refers to] domain names and other Network Solutions' services that help companies establish, manage and monitor a presence over the network. On the trust and communications side, that's what has traditionally been VeriSign with its digital authentication and digital signature services. Once you figure out how to communicate securely, you can transact business through our payment gateway

What new products have stemmed from the merger?

We're developing a portfolio of services so we can offer domain names coupled with certificates or a single managed service that helps you set up and monitor your DNS or your network security. In the second half of this year, we'll be introducing a secure domain name service that ties a certificate to a domain name to make it unspoofable. A few weeks ago, we announced the digital trust services framework... for making all of VeriSign's identity and transaction services [available] through XML interfaces and callable by Web services platforms from IBM, Microsoft or BEA Systems. From an enterprise customer perspective, this makes building Web services much easier.

VeriSign has been very acquisitive since the Network Solutions deal. What have you done to combine these companies?

We've done two significant acquisitions: NSI and Illuminet. We've disclosed seven other acquisitions and four asset purchases, but much of that was done for \$5 million here or \$15 million there. These were to consolidate our position in a market we were already in. About the middle of last year, it became more economical for VeriSign to acquire a few chosen [competitors] than to spend marketing dollars to go after their customers. While that's created a lot of noise... it was cheaper to do it that way. For

example, when we bought the assets of CyberCash we doubled our payment business.

How well have you absorbed the Illuminet acquisition, which brought you into the telephony arena?

That deal closed Dec. 13. There is a product road map we talk about in terms of bridging voice and data networks. This is very different from convergence. Will voice and data converge some day and everything will be on an IP network? We think that's a true statement, but we think it's a 15-year time frame. There's a huge opportunity for our company to bridge the two networks, to talk IP on one end and [Signaling System 7] on the other, to provide fast data lookup services across both worlds and new location-based services. We see trusted network services... that deliver messages from one client to another regardless of whether it's instant messaging, [secure messaging services] or e-mail. And we add that special VeriSign secret sauce around security to make sure the message wasn't changed along the way. You'll see the first of those services in the third quarter.

VeriSign Global Registry Services is your cash cow. What are you doing to drive new technology into the dot-com registry?

When we bought Network Solutions, we said the back-end registry was the crown jewel of the company and we would do many things with it beyond DNS lookups. [In March] we started rolling out a brand-new infrastruc-

ture that can respond to multiple types of lookups for payment information, caller ID and number portability. This has been a huge [research and development] project. At the end of last year, we had proven the system could respond to different protocols and scale to 100 billion lookups a day. Today, in our current network, we're handling more than 5 billion lookups a day, which is more than the phone system handles and more than the credit-card system handles. It's already the fastest transaction system on earth.

From a capital perspective, we spent \$120 million last year and [will spend] somewhere in the order of \$100 million this year and next on the registry. A third of that investment is related to this new infrastructure. We have 13 locations today where DNS queries are handled. We're going site by site and putting the new infrastructure in with the old. For our enterprise customers, this [investment] gives them the ability to buy a more robust set of directory and lookup services. All the things we talked about in Web services are going to need fast lookups.

What are the most exciting Internet technologies on the horizon, and how are you positioning VeriSign to take advantage of them?

Web services will create a new generation of innovation in the industry. The network will become the operating system. Software that is inherently built to talk to other software... is a fundamental change in the programming model. We're building everything at VeriSign to have XML interfaces. VeriSign will expand its set of security services for monitoring PKI, firewalls and VPNs. ■

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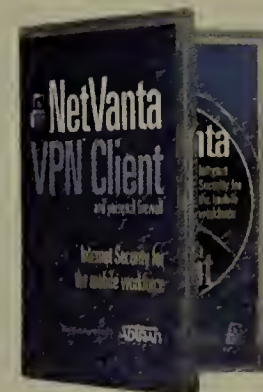


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Short Takes

■ **Sun** last week launched a box to fill out the top of its midrange server line and compete more effectively with IBM. The **Sun Fire 12K** server will compete against products such as IBM's Regatta server, which Big Blue launched last fall.

The Sun Fire 12K is aimed at customers looking to consolidate servers and move applications from mainframes onto servers, Sun says. The 12K can run four to 52 Ultra-SPARC III 900-MHz processors using up to 288G bytes of memory per server. Sun's 12K product, which was code-named Starkitty, is available now and costs between \$599,000 and \$1 million. www.sun.com

■ **I-Tech** recently rolled out a multi-protocol analyzer that helps customers diagnose and troubleshoot problems on their storage networks. The **Satellite-32MP Multi-Protocol Analyzer** can diagnose Fibre Channel and iSCSI protocols. The analyzer uses a graphical user interface to view results and can monitor from eight to 32 channels. The product with eight channels starts at \$73,900 and is expected to be available this quarter. www.i-tech.com

■ **EMC** improved the performance and capacity of its Clariion storage systems last week. The company is announcing 181G-byte 7,200-rpm and 36G-byte 15,000-rpm disks to complement the 73G-byte drives its storage arrays already use.

The new disks provide 9 to 22 terabytes of capacity per system at a 30% lower cost, the company says. And the 15,000-rpm drives operate more than twice as fast as 7,200-rpm drives.

The 181G-byte drives are available for the **Clarillon FC4500** and **FC4700** storage systems; the 36G-byte 15,000-rpm drives are available for the **Clarillon FC5300, FC4500** and **FC4700** systems. www.emc.com

InSite: Lessons from Leading Users

IP voice the cure for healthcare system

■ BY PHIL HOCHMUTH

Advocate Health Care has a sick phone system, but Chicago area's largest healthcare provider hopes to get better fast with a new IP-based telecom infrastructure from Alcatel.

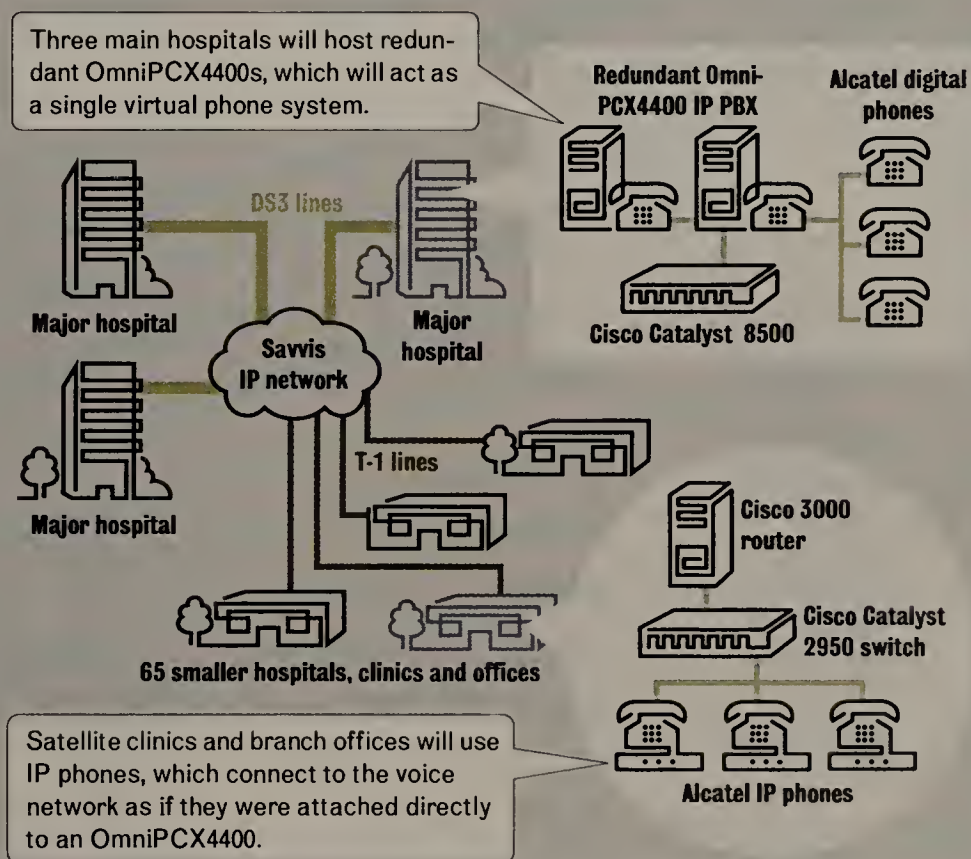
Advocate recently signed a \$15 million contract with Alcatel to provide the telecom infrastructure at 65 sites, including eight acute care and two children's hospitals, and several clinics and administrative offices. Based on Alcatel's OmniPCX4400 hybrid IP/digital phone system, the new telecom network will be rolled out over the next four years and is expected to save the group thousands of dollars per month on intersite phone tie lines. The new system also will make management easier, while providing a platform for merging IP telephony with other applications in the future.

Like many healthcare organizations, Advocate grew over the years through mergers and acquisitions. Along the way, the telecommunications group inherited a diverse set of

See Advocate, page 22

Advocating VoIP

Advocate Health Care is installing an Alcatel VoIP system in 65 sites in an effort to save thousands of dollars on phone costs.



Cisco shines up storage router

■ BY DENI CONNOR

PALM DESERT, CALIF — IT executives can configure and manage their Cisco storage routers the same as any network router with enhancements the company has made to its storage routing device.

The SN 5420, an IP storage router that transports SCSI data over an IP network, now supports virtual LANs (VLAN), authentication, authorization and accounting, and additional management information bases (MIB). Cisco also added AIX and HP-UX server capability to its support for Windows NT/2000, Solaris and Linux servers.

The idea behind the SN 5420 is to meld storage and IP networks to offer potentially

lower-cost storage network options. The two-port device sits between a LAN switch and SCSI or Fibre Channel storage devices, directing traffic between those storage devices and servers equipped with Gigabit Ethernet adapters supplied by Cisco and outfitted with iSCSI driver software.

One user likes the 5420 because it supports many of the same features his Catalyst 6500 and 4000 routers do.

"We already have Cisco network people on staff, and it's our expectation that we can minimize the impact on the support staff by using features we are already familiar with," says Hossein Shahrokhi, executive director of IT for the University of Houston-Downtown.

"Our strategy is to move a majority of

our servers to a storage-area network environment," he says. "We had two choices — traditional SAN or IP SAN. Given that we had invested significant dollars in networking with Cisco primarily, we chose [the SN 5420]."

The SN 5420 supports the VLAN Trunking Protocol, Remote Authentication Dial-In User Service (RADIUS) or TACACS+ authentication, Fibre Channel and iSCSI MIBs, and Cisco's own Cisco Discovery Protocol (CDP).

With VLAN support, servers connected to the router can share the storage network but only have access to specific devices, eliminating the need to build separate networks for different departments. The VLAN

See Cisco, page 22

TOLLY ON
TECHNOLOGYKevin
Tolly

Wireless civility — about to break down?

they have only been minimally successful. The basic technology is defined by the IEEE 802.11b standards group — thus, “dot 11b” is what you’ll typically hear when industry analysts want to get specific and let you know that they are talking about campus wireless rather than, say, 3G cellular.

Alphabet soup

Appropriately enough, it is this alphabet soup around which the future of campus wireless depends. In a nutshell — it all started with “b” offering 11M bit/sec transmission speeds using 2.4-GHz radios. That was first to market. To begin the confusion, gear based on the “a” standard came out some years later. This standard defines communications speeds of up to 54M bit/sec and uses a radio in the 5-GHz range — nice but incompatible with “b” gear.

Then, last fall, the IEEE approved work on a version of the 2.4-GHz technology that could run at the higher rates of “a” but would be compatible with “b.” Got it?

(Hmmm “b,” “a,” “g” — it’s like a Ouija board spelling out the word “baggage.”)

Alphabet soup aside, it would seem that we are on the verge of a battle royale the likes of which we haven’t seen since the “Fast Ethernet vs. 100VG-AnyLAN” war of the last decade.

The parallels are frightening. Years back, traditional 10M bit/sec Ethernet (“b” in our story) was viewed to be at the end of its useful life span. The “architecture” had reached its limits (or so it was thought).

Industry experts offered up a new, incompatible technology, 100VG-AnyLAN, as the future of wired Ethernet. In our story, this is the “dot a” technology.

Before that technology could take hold, proponents of the traditional Ethernet standard came back with a statement saying, in essence, “we are not dead yet” and proposed Fast Ethernet based largely on the 10M bit/sec standard. That would be the still-in-design “dot g” follow-on 2.4-GHz technology.

Like then, you really can’t have it both ways. As much as the wireless vendors

would like the world to believe that they are of one mind, they aren’t. And, once you work your way through the details, the higher-level issues become clear.

What isn’t clear, though, is which camp will prevail. It would be overly simplistic to think that history will just repeat itself. While similar, the situations aren’t identical.

The 2.4-GHz solutions are forever condemned to share that bandwidth with Bluetooth devices and wireless digital phones. And, to date, “dot g” is only a solution on paper — products are perhaps nine months to a year away.

To their credit, “big guys” such as Cisco have remained agnostic. Ironically, that might not help matters as, in the absence of a clear direction, the wireless LAN market might become a rudderless ship.

Tolly is president of The Tolly Group, a strategic consulting and independent testing company in Manasquan, N.J. He can be reached at ktolly@tolly.com or www.tolly.com.

Advocate

continued from page 21

voice systems, ranging from 3 to 25 years old, according to Dianne Bergen, Advocate’s telecommunications manager.

“We had just about one of everything you could buy on the market,” Bergen says. The result was a patchwork phone system that was not easily managed and was expensive to tie together.

“It was difficult trying to present our voice systems as a seamless image to patients and physicians and associates,” Bergen says. “We had a very difficult time doing just simple processing from site to site, let alone full integration.”

When looking to upgrade two years ago, Advocate tested products from seven different vendors, including Avaya, Nortel, Siemens and Cisco. Bergen says she found that most systems required that IP be deployed from the phone switch to the desktop, or the systems were just PBXs with IP mixed in and would be tough to migrate to all IP in the future, Bergen says.

“The Alcatel platform allows us to migrate to IP over time,” Bergen says. “We can use analog, digital or IP where we see a best fit for each and where we get the best return on investment.” Plus, she adds, “we were not quite ready for a whole IP voice world in one shot.”

Alcatel digital and analog handsets will be deployed along with OmniPCXs in Advocate’s major

hospitals this year in areas such as emergency, operating and recovery rooms, where Bergen says she does not want to run into any reliability or quality issues. However, IP phones and Alcatel remote-

“The Alcatel platform allows us to migrate to IP over time. . . . We were not quite ready for a whole IP voice world in one shot.”

Dianne Bergen

Telecommunications manager,
Advocate Health Care

office systems will be deployed in several of the 65 clinics, satellite offices and other sites throughout the Chicago area. Sites with just a few dozen people will receive IP phones that will tie back to the redundant OmniPCX4400s in one of the three major hospitals.

In addition to providing the single phone system Advocate sought, Bergen says, the telecom staff will save hundreds of working hours per year with the system’s single management system for adds, moves and changes, as opposed to running around from site to site, changing users on dozens of disparate PBXs and key systems. The telecom staff also can monitor overall system

performance and do call reporting for the first time, she says.

The Advocate network last year underwent a \$14 million LAN and WAN upgrade — Cisco Catalyst 6509 switches were installed along with a fiber in the LAN cores of its major hospitals. Catalyst 8400 WAN switches connect the hospitals over DS3 lines, which connect into a metropolitan-area fiber ring, operated by Savvis Communications. Cisco 3000 routers connect smaller clinics and administration buildings over the network via T-1 lines.

IP will be a big factor in connecting OmniPCXs together at each site, says Dan Weegar, IS director at Advocate. The IP PBXs will be trunked over the hospital’s metropolitan-area network, eliminating the \$2,000-per-month charge for dual T-1 voice tie lines connecting each site and providing up to half (or 25M bit/sec) of bandwidth vs. the 1.5M bit/sec on the T-1 lines.

“With IP, we can have as many number of IP trunks connecting the PCX,” as opposed to the dual T-1s the company uses now to tie its PBXs together, Weegar says. “They’ll get on that [DS3] highway and just drive.”

OmniPCX will let the hospital integrate voice into its plan for a centralized employee directory based on Lightweight Directory Access Protocol (LDAP), which it uses to run its Sun iPlanet e-mail system.

“Because we have such an extensive network [of employ-

ees], directories become out of date,” such as the company’s employee Web directory, Weegar says. “With LDAP integration, if telecom makes a change, that will automatically update every directory,” Weegar says the keypads and text displays on the IP and digital Alcatel phones will let end users look up directory names from a phone.

Advocate also will deploy Alcatel’s OmniTouch IP contact

center application in its two customer service call centers. OmniTouch IP call center software will give Advocate better integration with its customer service Web site, Weegar says, and will free up constraints on where call center workers are located.

“The fact that it will be virtual lets us have agents working at the [call] center, from a remote office or even telecommuting,” Weegar says. ■

Cisco

continued from page 21

Trunking Protocol automatically distributes configuration changes to other switches and routers on the network, eliminating manual entry.

The RADIUS and the Terminal Access Controller Access Control System, which control access to the storage network, both use the Challenge Handshake Authentication Protocol (CHAP). CHAP consults with RADIUS or TACACS+ to validate passwords. CDP, a media- and transport-independent protocol, is used on all Cisco routers, switches and bridges and lets other devices and applications discover and view Cisco devices via SNMP.

In addition to SNMP management, the SN 5420 also supports CiscoWorks 2000, Cisco’s Network Management product suite.

“The approach is that storage networking just becomes part of the larger network,” Shahrokhi says. “Storage is just a very spe-

cialized subset of that.”

At present, only Nishan Systems offers an IP storage switch — the company’s IPS 3000 and 4000 switches are multiprotocol switches with iSCSI and Fibre Channel-over-IP capability. They have eight and 16 ports, respectively, compared with Cisco’s one Fibre Channel and one Gigabit Ethernet port.

The SN 5420 starts at \$27,000 and is available now.

Cisco: www.cisco.com



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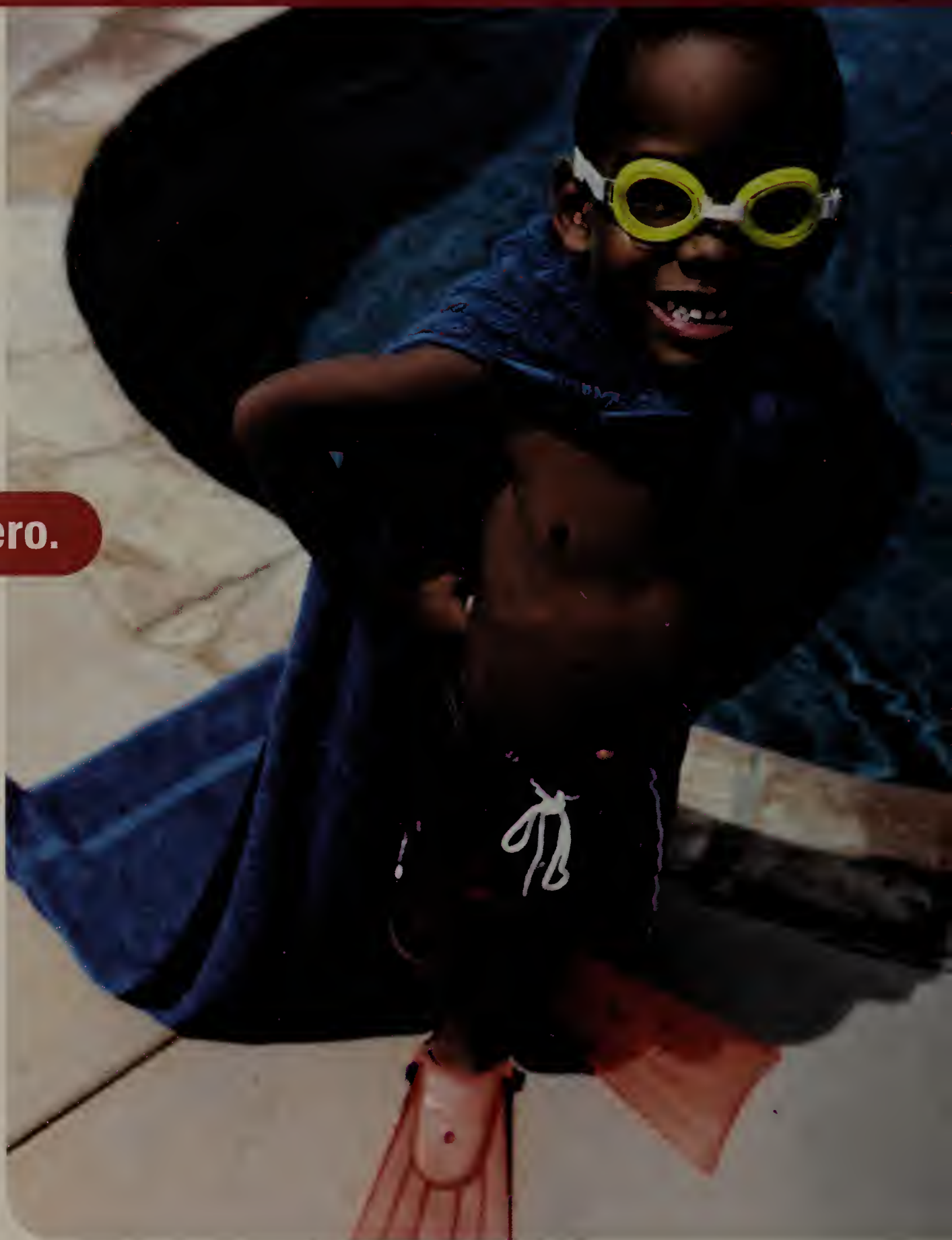
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Enterprise Applications

■ INTRANETS ■ MESSAGING/GROUPWARE
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Short Takes

■ **Sonic Foundry** last week unveiled its media management software suite, offering to help companies archive, organize and search their digital media assets and publish them on the Web. With **MediaSite Publisher 5.0**, companies can use their video, audio and text content to create online reference libraries, marketing and training tools, and other applications. In addition to video cataloging, indexing and publishing, users can export and import textual information, such as e-mail and notes, into a data index to supplement video descriptions. The XML export function lets other search engines reuse the media data. Pricing for MediaSite Publisher Version 5.0 starts at \$25,000. A workstation and server for publishing to the Web costs from \$50,000 to \$75,000, the company says. The products are available now. www.sonicfoundry.com

■ In its effort to beef up the security of its software, **Microsoft** last week made available a free tool designed to search out security vulnerabilities hiding in Windows-based computers. Called **Microsoft Baseline Security Analyzer**, the tool is intended to provide users with an easy way to check their systems for common problems that arise when computers are configured incorrectly. After scanning a system with the tool, users receive a security report card that lists all the holes and vulnerabilities found. MBSA does not download and install fixes but provides instructions on how to do so. The 2.5M-byte tool can be downloaded from Microsoft's developer Web site at www.microsoft.com/technet/security/tools/Tools/mbasahome.asp. It can be installed on Windows 2000 desktop and server operating systems and the Home and Professional Editions of Windows XP. Users also must have Version 5.1 or higher of Internet Explorer. MBSA also can be used to scan for security holes on Windows NT 4.0, 2000 and XP; Internet Information Server 4.0 and 5.0; SQL Server 7.0 and 2000, Internet Explorer 5.01 and later; and Office 2000 and XP.

Vendors bolster portal intelligence

■ BY JENNIFER MEARS

The commonwealth of Massachusetts was tired of its static government-agency Web pages. It wanted to provide an interactive portal that would make it easier for government employees, state residents and tourists to get the information they needed.

So it decided to use portal software from Epicentric as the framework for its statewide initiative. It also integrated a content management system from Interwoven into the portal, giving nontechnical officials the ability to update content as necessary.

"We wanted to establish an enterprisewide government portal, but we also wanted to ensure that it wasn't just a small subset of people updating information," says Bob Nevins, director of Mass.gov. "In the past we had one or two Web developers within each agency and they had to send files to the IT division to get them posted.... What this content management software will do is get us out of the business of being the middleman."

The trend of combining portals with content management systems is growing

among businesses as they recognize that the value of portals lies beyond being simply static interfaces to a range of information. Portals are maturing into dynamic, interactive entryways to the content, applications and resources that keep businesses running.

As a result, businesses find that they need a streamlined way to manage the masses of content that they'd like to include within the portal. In addition, the content needs to be categorized so that it is searchable from within the portal. Content management systems provide both of those functions.

Many portals offer some level of content management capabilities, analysts say. Epicentric and Plumtree include content repositories that let users manage content created within the portal. Plumtree recently announced the release of Collaboration Server, which builds on technology the company acquired from content management software maker Hablador to give portal users additional features such as workflow to manage the creation of content.

Glenn Kelman, a Plumtree vice president, says businesses can expect Plumtree to continue to incorporate Hablador technol-

Portals and content

Here are some issues to consider before integrating a content management system with your portal:

- **Where is content coming from?**
If you plan to use content within the portal framework, the content management capabilities within the portal may suffice. If you bring in content from a variety of sources, an integrated content management system will make life easier.
- **Who's contributing content?**
A content management system will make it possible to lift the responsibility of creating and updating content off your Web development team and put it into the hands of business users.
- **What are you doing with the content?**
If you want portal users to be able to search content across back-end business resources, a content management system is your best bet.

ogy into its product and roll out increasingly sophisticated content management capabilities by yearend.

See Portals, page 28

Tivoli to improve business mgmt. wares

Management software helps users operate more efficiently.

■ BY DENISE DUBIE

AUSTIN, TEXAS — Tivoli Software last week unveiled a revamped product portfolio that the company says will help its customers more closely tie IT and business management together.

Tivoli is introducing products that will help users manage targeted aspects of their business, rather than specific components such as routers or servers.

One new software offering, IBM Tivoli Service Level Advisor, will let customers track how well a service is delivered to end users by monitoring all the components comprising the application, the company says. Service Level Advisor runs on AIX, Solaris, Linux and Windows 2000 and NT servers, and uses Tivoli — and/or a third-party vendor — agents distributed throughout a customer's network to watch a process from user request to service delivery.

The software pulls agent data to a central management console, such as Tivoli Enterprise Console (TEC), where customers can track the response times of IBM databases, Web and application servers, and third-party devices tied to the service. TEC also got an overhaul with this release. The network management

console software now integrates with Tivoli's NetView mainframe monitoring software, making it possible for users to manage their legacy mainframe networks alongside their distributed networks.

Beta user David Hamilton says the real value Tivoli offers is in defining the processes to be monitored. As director for telecommunications and technical services for Sutter Health in Sacramento, Calif., he says helping the patient care professionals in the nonprofit organization define how they need the network to respond makes his job easier.

"With Service Level Advisor, I have been able to create service levels specific to specific parts of Sutter's business," Hamilton says. "It's hard to tell a nurse or a doctor that despite the problems they may have had, the server was available for 99% of the time. That kind of information doesn't matter to them."

Up and running within a day for Hamilton, Service Level Advisor collects data from every monitored device and brings it back to a central console to show him how network components are performing. Hamilton says he's working with Tivoli to make the software integrate with more third-party tools. "Out of the gate, it manages other Tivoli products, but I'd like to be able to

See Tivoli, page 30



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A photograph of an older man with glasses, wearing a patterned sweater, sitting and reading a book to a young boy. The boy is looking down at the book. They are in a classroom, with shelves of books visible in the background. The text "Your customers can be demanding" is overlaid in white on the right side of the image.

Your customers can be demanding

Bob Willey

Vice President of Information Services, KinderCare Learning Centers

"We don't consider HP a vendor, we consider them a partner. They know where we've been—but more important, they know where we're going."

So when it came time to relocate their headquarters, KinderCare turned to a partner they grew up with: HP. Already working in an HP environment, KinderCare systems administrators took this opportunity to reevaluate their needs.

With over 1,100 locations—and growing—they needed a scalable solution that could handle more than the current 300 users at a time. After all, how could employees provide the instant gratification that kids desire if they couldn't get it themselves? Updated HP servers and HP Critical Systems Support did the trick.

Now, updates that used to take hours take place in only 12 minutes. Which means KinderCare employees can devote even more of their efforts to what they do best: teaching and caring for children.

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Groove software targets enterprise needs

■ BY JOHN FONTANA

BEVERLY, MASS. — Groove Networks this week will make its largest commitment yet to adapting its collaboration software to satisfy the requirements of large companies.

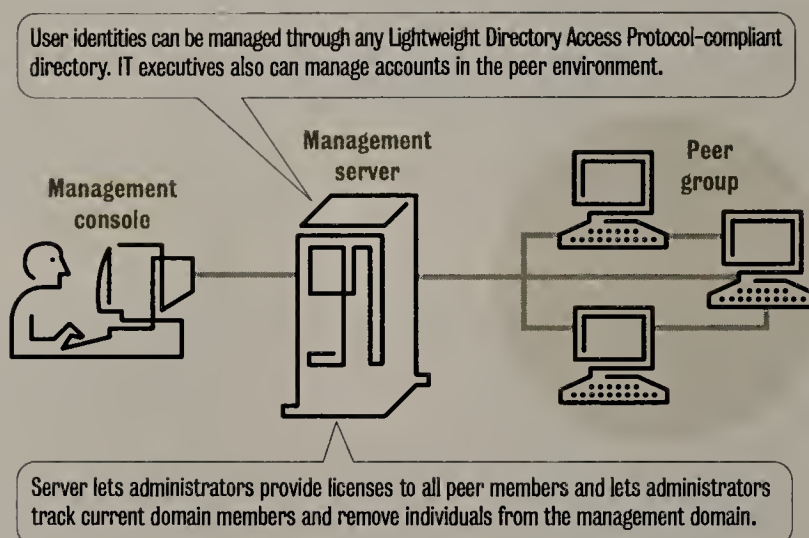
With the release of Groove 2.0, the company is adding three enterprise servers that let IT executives manage accounts and user identities, control the quality of service (QoS) of Groove's collaboration environment and integrate enterprise systems into Groove's concept of a virtual shared space.

Control is what enterprise users have demanded since Groove debuted its peer-to-peer client and development environment to great fanfare nearly three years ago.

"They are taking a strong and elegant technology and tailoring it to the practical needs of the enterprise," says Dana Gardner, an analyst with Aberdeen Group. "The problem was relating the technology to what companies wanted [peer-to-peer] may be the technology, but companies still

Control factor

Control is the name of the game with the release of Groove 2.0. Key to this control is Groove's Management Server and console, which support these features:



want some degree of control."

Groove officials say 2.0 gives it to them.

Version 2.0's Management Server lets user identities be managed through any Lightweight Directory Access Protocol-compliant directory, and allows for the creation of trusted domains of users and central control of use

policies for components within Groove.

The server also supports reports that give a snapshot of Groove usage within a company.

Groove also has built in its first data recovery feature, letting IT executives set a hidden password on accounts so data can be recovered from the Groove client

of a departed employee.

Relay Server, a sort of store-and-forward router that encrypts data, lets administrators control client traffic and storage limits, and adds a QoS element to the Groove environment. Relay Server is needed for Groove deployments on a WAN over a firewall and for offline use of Groove on the LAN.

In the past, Management Server and Relay Server were only available as a hosted service through Groove, an option that is still available.

"We have seen that IT wants to control the deployment and management of Groove within the enterprise just like with any software," says Richard Eckel, a vice president with Groove.

The third and brand-new piece is Enterprise Integration Server, which provides a framework to create server-based connectors, called Bots, to enterprise systems. Bots let systems such as knowledge management and enterprise resource planning (ERP) act as a peer in the Groove collaboration environment. For example, they can send notifications when events are triggered in

an ERP system.

Groove also added a performance feature called Binary Diff, which lets the Groove client pass in real-time only the data that has been updated in a document.

In addition, Groove has added a set of utilities including integration with Microsoft's Outlook so e-mail threads can be added into a Groove shared space, an Update tool that lets documents be shared in real-time and a project management tool. Groove also has integrated its development environment with Microsoft's Visual Studio.Net, which lets developers create .Net applications that use the synchronization and security features of Groove.

The Groove standard client is priced at \$50 and the Professional version at \$100. Management Server, which runs on Windows 2000 and SQL Server 2000, is \$20,000. Relay Server and Integration Server are each priced at \$10,000 and run on Windows 2000. All are available now.

Groove: www.groovenetworks.com

Portals

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Kelman agrees with executives from other portal vendors who stress that partnerships with content management companies will continue to be important because businesses often need content management for more than just the portal.

"The way we view it is if a company wants content management for all of its back-end systems, Plumtree isn't going to be the best solution for them. They should use one of our partners," Kelman says.

Plumtree partners with content management software vendors such as Interwoven, Documentum and Stellent, providing out-of-the-box integration with those content management systems. Epicentric also partners with a range of content management vendors.

"Our customers have content management capabilities [with the portal], but we often find that they have several different content management systems and they want to use the portal to bridge across those," says Ed Anuff, co-founder and chief strategy officer at Epicentric. "So within the portal you might be seeing content that comes from both a Documentum and an Interwoven, as well as content management from Stellent, and also utilizing content from Epicentric's internal con-

tent management systems, all side by side published within the portal."

CoreChange recently announced that its portal product, CorePort, would integrate with Microsoft's Content Management Server. "We see content management as one of the single biggest challenges facing our customers," says Sarah Bassett, director of product marketing at CoreChange. "When you bring together the portal and content management, what you get is control over how information is presented and you enable business users to create and publish their own content."

In many cases, businesses are using the portal to streamline multiple company intranets, and using a content management system makes it easier to maintain a consistent look and feel as disparate deployments are unified, analysts say.

"A lot of people start with a portal and need to consolidate 150 intranet sites," says Rob Perry, an analyst with The Yankee Group. "You realize that to really connect those together, you've got to have consistency about how content is tagged and managed. It's just a natural evolution of these things [portals and content management] coming together."

American Electric Power (AEP) in Ohio turned to CoreChange to help unify dozens of its disparate intranet Web sites into one portal for its 23,000 employees. William Amurgis, principal Web consul-

tant at AEP, says the company is using a homegrown content management system.

"But in all likelihood we will pursue a content management system because we know it has value, especially for our externally facing portal. And as people get used to using the homegrown content management system, they will start to outgrow that," Amurgis says.

One drawback about content manage-

“This content management software will get us out of the business of being the middleman.”

Bob Nevins
director, Mass.gov

ment systems, Amurgis says, is that they can be costly and complicated to deploy. Content management vendors are addressing that. FatWire earlier this year announced a low-cost, lightweight version of its Java-based content management system specifically for portals.

FatWire's Spark portal Content Management (pCM) includes basic department-level content management functions but

can be easily upgraded to full enterprisewide capabilities. Spark pCM is designed to work with BEA Systems' WebLogic portal, but later releases will support integration with portals from vendors such as IBM, Oracle and Sun.

In February, Documentum unveiled its Portal Integration Pack to enable the fast, easy integration of its content management features with enterprise portals such as Plumtree and Epicentric. Interwoven focuses on open standards to allow for easy integration of its capabilities with virtually any portal, says Mark Hale, director of content technology at Interwoven.

"There is a tremendous amount of demand, within the last four months, probably five- to tenfold increase just based on my personal experience with customers," Hale says. "It's been significant."

Hank Barnes, chief strategy officer at software maker Divine, says businesses with portal deployments will find that content management is what ultimately makes their portals a success.

"We've believed for a long time that content management and portals are naturally intertwined. Content is what drives portals," he says. "You might have a number of different portals within your business, but all of them require up-to-date, relevant content or else people won't use them." ■

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Do you tell anyone when your company gets hacked? According to a FBI-run survey released April 7, people increasingly answer this question "no." This is clearly not good news if there is any benefit to prosecuting hackers. It also is not good for many other reasons.

The FBI survey was the seventh in an annual series and involved 503 U.S. government agencies and companies, including universities and medical and financial institutions. Most readers would find the results discouraging. Almost all — 90% of the survey respondents — said their computers had been attacked within the past year, but only 34% said they reported the

Your confession is good for us

attacks. The high level of attacks is not unexpected actually — I suspect that the percentage is not higher only because some attacks were not detected. But the low level of reporting, even lower than what was found last year, is not good for the security of the 'Net.

Attacks are frequently not reported because of a fear of bad publicity and, I expect, because of a fear of potential liabilities if information about third parties, such as customers, was exposed.

But there is real money involved here. The half of the survey respondents who were willing to talk about their losses said they lost an average of \$1.8 million each because of these attacks. This is a significant increase from last year.

The lack of companies reporting attacks makes it harder for authorities to identify patterns of attacks or to prosecute the attackers. It also makes it harder for vendors to know what security vulnerabilities to work on and harder for groups such as

CERT (www.cert.org) to develop advice on network designs or device configuration to minimize the vulnerability to attackers.

Doing security correctly can be hard. Consider, for example, the U.S. Department of the Interior. Many of its computers are still disconnected from the Internet four months after a judge ordered them to be disconnected until they were secure. But trying to get security right in the dark is even harder.

The victims in many of the attacks were organizations, but there were often other victims as well. Personnel records on employees and histories of customer interaction, complete with credit card information, were also exposed.

It is not good for society or in the long-term interests of an organization to not report attacks on organizational resources. But it should be cause for criminal liability (such as jail time) to fail to report to authorities cases where information about third parties, including employ-

ees, customers and others, has been exposed. It also should be cause for criminal liability to not individually inform the people whose information was exposed about the incident and the level of exposure. I need to know if some hacker got my credit card number because some vendor Web site was poorly configured or was using buggy software and the operators were slow to apply security updates.

When you are in the middle of an incident it seems quite reasonable to keep potentially embarrassing news out of the press. But think twice. Be sure that covering up for an attacker, whether a disgruntled employee or industrial spy, is really the right thing to do.

Disclaimer: Because Harvard never does anything embarrassing, the above must be my own exhortation.

Bradner is a consultant with Harvard University's University Information System. He can be reached at sob@sobco.com.

Funk readies wireless LAN security package

■ BY ELLEN MESSMER

CAMBRIDGE, MASS. — Funk Software this week will unveil Odyssey, a wireless LAN authentication server that can be used with a variety of vendors' 802.11 wireless products to ensure that users properly authenticate their identities before being granted access to network services.

Odyssey Version 1.0, which costs \$2,500, is a package that includes client authentication software for Windows-based PCs or laptops running XP, 2000, 98 or Millennium Edition, and a second component, the Odyssey Server, that runs on Win 2000 or XP.

The Odyssey server, typically housed on an Ethernet LAN, compels each user with a wireless device to prove identity through a password or other means defined by the challenge-response mechanism in the IEEE security standard 802.1X.

"The IEEE 802.1X standard from last spring introduced requirements for mutual authentication between the client and server for 802.11 a, b, and g," says Joe Ryan, vice president at Funk. "The wireless LAN adapter cards out there had to be updated for it, and many of the major vendors have now done that, such as Avaya, Cisco, Agere and 3Com."

A change of scenery

Funk, which for a decade has marketed its Steel-Belted Radius line of authentication servers for large companies and ISPs, decided the time was ripe to introduce its first wireless LAN authentication server aimed at small to midsize organizations putting in wireless LANs.

Like the other Funk authentication



“[Wireless LANs] are terrifying because they open new vulnerabilities that you have to address.”

Michael Franklin
Network manager,
Colby-Sawyer College

servers, Odyssey takes advantage of the Remote Authentication Dial-In User Service authentication protocol for transferring authentication requests between other back-end servers, such as those used for hardware-based token authentication, where specialized servers perform a user look-up and approval process and transfer the authentication information back through RADIUS.

The competition

Funk's Odyssey competes against Cisco's Secure Access Control Server, except that Cisco supports proprietary extensions to the Extensible Authentication Protocol (Cisco calls it Lightweight EAP), which results in the Cisco ACS only working with the Cisco wireless LAN equipment.

EAP is an IETF protocol defined in RFC 2284 that defines multiple authentication methods such as passwords, tokens, Kerberos and digital certifications. Other wireless LAN vendors also have variations on EAP. Cognizant of that, Funk is carving out a role for Odyssey by supporting authentication in a range of vendor wire-

less LANs and 802.11 client software.

"To begin with, Microsoft only supports 802.1X EAP in XP and you have to use Microsoft digital certificates for authentication," Ryan says. Some organizations might prefer passwords to certificates. And they also might want to extend wireless LAN authentication to users of older versions of Windows without 802.1X embedded in the software. For that reason, Funk is offering 802.1X client software, which doesn't require certificates, for XP, Win 2000, 98, Millennium Edition, and later in the year, CE.

No certificates

"We didn't want to go the certificate route," says Michael Franklin, network manager at Colby-Sawyer College in New London, N.H., which has been a beta-ver-

sion customer for Odyssey for use with Enterasys Networks and Cisco wireless LANs on its campus.

"And I have multiple vendor wireless LAN access points, so I can't really use a proprietary approach," he adds.

Passwords grant a "reasonable level of security," says Franklin, noting Colby-Sawyer College will stick with one authentication type to start. Wireless LANs are "terrifying," Franklin says, "because they open new vulnerabilities that you have to address," such as the prospect of intruders joining a LAN without authorization and gaining access to the internal network if you don't authenticate them.

Funk is expected to add 802.1X security authentication support to its Steel-Belted Radius server line by June.

Funk: www.funk.com

Tivoli

continued from page 25

leverage all my tools," Hamilton says.

Other product announcements from Tivoli include the IBM Tivoli Enterprise Data Warehouse, a DB2-based data repository that will be built into future Tivoli software free of charge. The idea is to let users aggregate systems and performance management information from disparate systems in one location and use that information to measure the impact of problems on specific parts of the business.

"The availability of a management metrics warehouse is what makes this version a major step forward," says Jean-Pierre Garbani, an analyst with Giga Information Group.

Tivoli also unveiled its Switch Analyzer,

network management software that performs autodiscovery of Layer 2 switches.

Competitors such as Computer Associates, Hewlett-Packard, BMC Software and Managed Objects all focus on business process management over traditional network management, analysts say.

Tivoli products are available now through IBM Passport Advantage purchasing model, and Service Level Advisor costs \$450 per processor with maintenance included for the first year.

Tivoli: www.tivoli.com



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Short Takes

■ **Telelobe Communications** has expanded the reach of its IP VPN service to 95 cities in 33 countries. The carrier launched its IP VPN service in July. The service runs over Telelobe's global IP fiber-optic network that uses Multi-protocol Label Switching to support class-of-service traffic prioritization. The carrier has deployed Cisco and Juniper Networks gear at the edge of its network with Cisco gear at its core. Telelobe's IP VPN service is expected to be available in 150 cities by year-end. www.teleglobe.com

■ Broadband service provider **M-power Communications** formally filed for Chapter 11 bankruptcy protection last week. Last month M-power reached a deal with its debt holders that would see those parties get an 85% stake in the company in return for supporting a Chapter 11 reorganization. Mpower plans to continue providing service to its approximately 120,000 customers during the bankruptcy proceedings.

■ Earlier this month **WorldCom** inked a 10-year deal with the **Department of Defense** to provide WAN services for the **Defense Research and Engineering Network**. The network supports more than 6,000 Department of Defense scientists and engineers throughout the U.S. The deal might be worth as much as \$450 million. WorldCom will provide a private, high-speed network that will support ATM and IPv6.

■ U.K. satellite communications company **Inmarsat** has made its in-flight Internet access service available to the corporate jet market and expects to do the same for commercial airlines by year-end. Inmarsat will first roll out its **Swift64** service with ISDN Internet access, which it expects to be fully operational on corporate aircrafts within a few months. Servers for e-mail connections will be placed onboard aircrafts and users can connect to the service over their laptops using an Ethernet LAN connection.

Telecom competition lives

Despite bankruptcies, industry experts say other CLECs are succeeding.

■ BY MICHAEL MARTIN

High-profile metropolitan Ethernet provider Yipes Communications joined a parade of competitive local exchange carriers by filing for bankruptcy protection last month. Several more CLECs, including XO Communications, are teetering on the brink.

So it comes as some surprise to see a pair of recent analyst reports assert that competition in the business telecom market is not only alive and well, but also growing.

How can competition be thriving when so many competitive carriers have gone belly up?

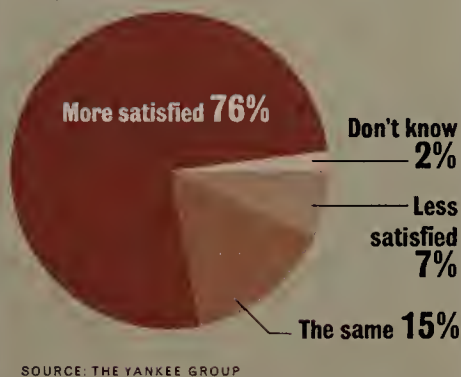
The demise of so many CLECs has a lot to do with the success of the remaining carriers, say the authors of the studies from The Eastern Management Group and The Yankee Group.

"There were too many providers in the market before and now that there are fewer, the remaining ones are becoming more stable," says Robert Saunders, an analyst with The Eastern Management Group. Instead of competing with one another, as they were in the past, the CLECs now can focus their attention on competing with

Service with a smile

Customers who have switched to a CLEC are generally happier with the customer service of their new provider.

Percent of midsize-business respondents:



the regional Bell operating companies.

Three of the more stable CLECs remaining are Allegiance Telecom, Time Warner Telecom and NuVox Communications, Saunders says.

Allegiance focuses on selling voice and

data services to small- and midsize-business customers in 36 metropolitan markets. Time Warner Telecom targets larger customers in 44 metropolitan markets with a variety of broadband and optical offerings. NuVox serves up voice and data to 30 markets in the Midwest and Southeast.

A number of smaller, regional players are also having a great deal of success, he says.

Michael Lauricella, an analyst with The Yankee Group, says Conversent Communications, a facilities-based CLEC serving New England, is another provider enjoying some success in growing its business.

Both reports rely on Federal Communications Commission statistics to back their claims of growing competition. The key statistic is the growth in switched access lines. In June 2001, CLECs reported having 17.3 million of the nation's 192 million switched access lines — up 16% from 14.9 million access lines at the end of 2000.

According to the FCC, telecom competition is highest in: New York, where CLECs provide 20% of the access lines; Texas, where they hold 12%; Massachusetts, with 11%; and Pennsylvania, with 10% penetration.

See CLECs, page 34

Mirror Image looking to push apps

■ BY JENNIFER MEARS

WOBURN, MASS. — As content delivery networks evolve to handle more than just static content, the latest service provider to move in a more sophisticated direction is Mirror Image Internet, which is latching on to the Web services bandwagon.

The content delivery company recently announced plans to enhance its network of content access points (CAP) to support content and applications. It's doing so by supporting Microsoft's .Net and Sun's Java 2 Platform Enterprise Edition within its CAP servers. This will let customers or Mirror Image centrally manage Web-based applications, and establish support for Web services standards such as XML, Simple Object Access Protocol, Web Services Delivery Language and Universal Description, Discovery and Integration.

"We're driving hard now to push into the next world that's moving beyond display

elements into application delivery," says Bob Hammond, a senior vice president at Mirror Image. "We're going to the application layer and starting to provide services so that applications can talk with applications on the Internet."

However, the question is whether Mirror Image customers will take to the idea. Sean Armstrong, senior Internet manager at Network Intelligence, formerly Open-Systems, is intrigued by the prospect of using Mirror Image to deliver applications. The network intelligence software maker uses Mirror Image to deliver its software downloads.

"It would leverage the size and speed of Mirror Image's infrastructure to alleviate the load balancing and single point of failure concerns I have with our current Web infrastructure," he says.

But until the standards for Web services become better defined, Armstrong says he won't invest the time and resources in writ-

ing applications designed for the Web.

"I am holding off until all of the details are hashed out, the language is available for me to learn and it has been proven bulletproof," he says. "A Webmaster releasing control of the Web server to an outside service is a big leap of faith and one that I'm not ready for yet."

Still, analysts predict that as Web services

See Mirror Image, page 34



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EYE ON THE CARRIERS

Lisa Pierce



Roaming fees critical for high-speed wireless data

The combined market share of the top four U.S. providers is about 75%, and of these leaders, no individual share exceeds the mid 20s.

To minimize roaming costs, providers expanded their geographic footprints by buying or swapping spectrum, or through alliances. Until recently, roaming was primarily on analog service. But, high-speed data must remain on a compatible digital infrastructure; it cannot be supported by analog or 2G data such as Cellular Digital Packet Data.

Therefore, the expansion of the 2.5G digital footprint is critical, and is a key motivation behind Verizon's intentions to convert

100% of its network to CDMA/1xRTT service and Cingular's announced GSM/GPRS-related joint-venture plans with AT&T Wireless and VoiceStream.

Prices for intracarrier wireless data services take two forms: Verizon offers minute-based and megabyte-based prices. In contrast, AT&T Wireless and Cingular offer bundles of megabyte-based prices. In all cases, the higher the volume purchased in advance, the less expensive the price per megabyte. At the top end, a \$200 per month service buys 200M bytes. At the low-volume end, the price is as high as \$8 per megabyte — with a 2M-byte minimum.

Unlike users in most other countries, the sender and the receiver of information will be billed — a nice arrangement for U.S. mobile carriers. But, what about cross-service (GPRS/1xRTT), multiprovider multiprotocol roaming?

Apart from standardized, intracompany applications, it is reasonable to expect that while transmitting short messages, individ-

uals might send and receive messages to users of other providers — on average, 70% to 80% of the time.

Canadian providers have solved this by agreeing to use the same technology to support multiprotocol, intercarrier Short Message Service (SMS), courtesy of CMG Wireless Data Solutions.

Unlike Canada, no single cross-technology bridging platform has been embraced in the U.S. Every major provider we spoke with says it is working on this, but let's be clear about what it will take: Each bilateral agreement must be negotiated separately, and must tackle a number of thorny issues, including interoperability and intercarrier roaming/settlement fees.

Compared with the Canadian approach, any-to-any connectivity will take longer to materialize — no less than six agreements must be crafted between the top four providers.

The addition of a fifth provider — for example, the incumbent national GSM-

GPRS provider VoiceStream — would require an additional four agreements. The addition of a sixth provider would require five more contracts. And on it goes.

And because it is unlikely that intercarrier settlement fees will be set at a uniform rate (or structure), each primary mobile carrier must mask differences in roaming fees on subscriber bills if it wants to encourage, not discourage, use of mobile data applications.

The paradox is that although not discussed by many U.S. providers, the price of intracarrier messages might be one of the least important considerations when shopping for a SMS provider in the U.S. One of the most important considerations, especially for SMS, will be the primary provider's roaming partners, and applicable fees.

Pierce is a research fellow at Giga Information Group. She can be reached at lpierce@gigaweb.com.

Mirror Image

continued from page 33

gain better footing of content delivery networks — originally designed to speed the delivery of static images in Web sites — they will play a crucial role in how businesses move applications over the Web. Akamai Technologies, for example, recently announced a partnership with Microsoft to develop support for Microsoft's .Net platform so that Web services can be deployed from Akamai's network of caching servers at the edge of the Internet.

However at this point most analysts agree that there is more hype than substance behind the concept of Web services, which basically consist of application components that can interact with each other on the fly.

Uncertainty also exists about which Web services will lend themselves to delivery over a CDN.

"The question remains: Which applications are

“The question remains: Which applications are suited to be distributed or delivered through an overlay network of CDN services.”

Greg Howard

Principal analyst, High Tech Resource Consulting Group

suited to be distributed or delivered through an overlay network of CDN devices," says Greg Howard, principal analyst at High Tech Resource Consulting Group.

For its part, Mirror Image is targeting its new services to companies in the financial, media, retail, manufacturing and travel industries. In addition, the new Web Services Delivery Gateway appliance that provides centralized management of applications will enable businesses to handle some of the sticky issues surrounding Web services such as security, monitoring

and billing, Hammond says.

Moreover, the new, enhanced services make it possible for companies to develop and host Web-based applications with Mirror Image, reducing infrastructure and staffing demands internally, Hammond says.

Mirror Image executives say their network is well-suited to support application delivery because of its architecture, which differs from competitors' such as Akamai Technologies' and Speedera Networks'. Akamai and Speedera have installed thousands of edge servers on hundreds of public networks around the world.

On the other hand, Mirror Image has fewer than two dozen CAPs in the U.S., Europe and Asia. These CAPs include servers, routers, databases and other hardware and software, which Mirror Image executives say give customers more processing power at the edge.

"Rather than delivering static content as has been the core of content distribution, now we'll have a situation where you're actually going to be storing executables out at the edge of the network," says Scott Bishop, marketing director at Mirror Image. "We've prided ourselves on our gargantuan CAPs at the aggregation points [of the Internet] that include a lot of computer power and storage."

Howard agrees that the Mirror Image architecture is well designed to support applications, "but the question remains what are those applications going to be and where are the customers?"

Mirror Image: www.mirror-image.com

PROFILE: MIRROR IMAGE INTERNET

Location: Woburn, Mass.

Founded: 1997

Product: Delivers content from the edge of the Internet using its global network of content access points.

Financing: Principally owned by Internet holding company Xcelera.

Employees: 150

Competitors: Akamai Technologies, Speedera Networks, Digital Island.

CLECs

continued from page 33

The recent run of bankruptcies may have hurt the reputation of CLECs in some circles, but often a customer of a bankrupt CLEC will look for another CLEC when it searches for a replacement provider, Saunders says.

"They get used to the price. They think the service is better, and they like the idea of an integrated access service," he says.

Integrated access services are offerings that allow businesses to get their voice and data over one connection, even though the voice and data may be traveling over separate channels. For example, a competitive carrier could bring a T-1 line into a business, dedicate 12 channels to voice and the other 12 channels to data.

The RBOCs don't offer comparable services, Yankee Group's Lauricella says. And because integrated access services are cost-efficient for the competitive carriers, they allow the CLECs to differentiate themselves from the incumbent providers on pricing, without forcing the CLECs to sell the services at a loss.

Another area that sets the CLECs apart from the RBOCs is customer service. According to Yankee Group research, CLEC customers usually are happier with the customer service they get from their new provider.

"The CLECs are smaller and very focused on the market

“[CLEC customers] get used to the price. They think the service is better, and they like the idea of an integrated access service.”

Robert Saunders

Analyst, Eastern Management Group

they serve," Lauricella says. "The RBOCs have a large customer base [and] a variety of products to sell, and they often have a harder time getting a focus."

While the CLECs are having some success winning over enterprise-class customers, most of their business is still generated by midsize companies with 1,000 or fewer employees, Lauricella says.

Telecom competition might be increasing now, but there's no guarantee it will continue to do so.

Legislation affecting wholesale access rates on incumbent networks, such as the Tauzin-Dingell bill before the U.S. Senate, could have a dramatic impact on whether competitive providers thrive or die, Lauricella says.

"But to say that all of these companies are going to be bankrupt tomorrow is really premature," he adds. ■

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Special Focus

IP VPN SERVICES: Cost may be a factor, but features carry the day.

Sifting through managed IP VPN options

■ BY DENISE PAPPALARDO

Most carriers have a managed IPVPN offering of some kind that features services ranging from dedicated secure site-to-site networking over one IP backbone to secure remote access over the Internet.

But sorting through these options can be daunting. What follows are the experiences of three users.

The Cystic Fibrosis Foundation contracted with WorldCom 18 months ago to deploy a site-to-site VPN that replaced a dial-up system the nonprofit group was using to communicate between CFF chapters.

More than 300 CFF employees were accessing the corporate network through a bank of dial-up modems. "That was really not effective and didn't make sense," says CIO Greg August. "It was impossible for folks to stay in touch and operate in this day and age."

The foundation's VPN, which is based on WorldCom's IP VPN Dedicated Fully Managed service, connects 50 remote chapters over the carrier's Internet backbone. Each site has a Lucent AccessPoint router that supports up to 168-bit encryption. Each chapter is connecting to CFF's main site in Bethesda, Md., via T-1s or 56K bit/sec lines.

Once employees connect to the corporate network they often are going back out to the Internet or another private network to reach one of four application service providers (ASP) that are used by CFF.

"We're trying to outsource as much of our technical capabilities as possible," August says. "We don't want to have to retain a large IT staff, and outsourcing allows us to keep our eye on the ball of fundraising."



“We’re trying to outsource as much of our technical capabilities as possible. We don’t want to have to retain a large IT staff, and outsourcing allows us to keep our eye on the ball of fundraising.”

Greg August

CIO, Cystic Fibrosis Foundation

when we looked at it. It was hard to manage," he says.

While the initial deployment went well, August says there were some "interesting" network address translation issues that WorldCom had to work through. "We have a complex environment because of the number of ASPs we're working with," he says. "But WorldCom has been able to accommodate us effectively."

Although August says WorldCom's service rates were in line with his expectations, he adds that IP VPN services in general remain "vastly expensive." But August declined to provide specifics on his monthly service expenses.

Serving a captive audience

While CFF is using its IP VPN to improve communication among remote offices, Captivate Network is using one to deliver services to its customers.

Captivate offers video content on flat-panel screens in elevators of high-rise office buildings around the country. The company has about 4,000 screens in North America.

Captivate started looking a year ago for a dependable network option to support delivering content to nearly 300 buildings in large metropolitan areas such as Chicago, New York, Boston, Los Angeles and San Francisco. Qwest Communications was one of a few providers that met the company's network needs, says Ray Pineau, vice president of engineering and production at the Westford, Mass., company.

The company is using Qwest's fully managed Network VPN service, which is built on Nortel Shasta VPN devices. Instead of deploying VPN gear at each customer location, Qwest only requires users to have a standard router deployed to support a dedicated connection to the Internet.

"Qwest's service is something similar to a private network, but less expensive," Pineau says.

Captivate has 70 buildings connected to its IP VPN and plans to have 270 connected by the end of June. "Before working with Qwest we had dial-up lines in the U.S.," Pineau says. "We were investigating DSL and went pretty far down that path, but there were a lot of problems. DSL companies were going out of business, filing for bankruptcy, and there were issues about some sites being too far from a carrier's [point of presence]."

Qwest's offer was more attractive because the carrier could support all Captivate's customers in the U.S. "What was unique about [Qwest's] product is they provide a fractional T-1 to a [central office] and they have Shasta equipment that does the encryption over their IP network," he says. "It's not over the public Internet."

Captivate also is hosting servers within Qwest's data center, which provides the company with a centralized hub for its content. Captivate has EMC storage gear, Nokia firewalls and servers with Windows software running over

Intel hardware deployed within the data center.

"We have a highly reliable computer infrastructure that we need 24-7," he says. This is where Captivate stores and then publishes content for its elevator screens from partners such as CNN, The Weather Channel, *The New York Times* and the *Wall Street Journal*.

The company was using hosting services from NaviSite, but because Qwest could combine Captivate's hosting and VPN termination the company now is saving money, Pineau says.

He says the company is working with Qwest to expand the service to its Canadian customers.

Deloitte supports traveling users

While dedicated VPNs are a popular choice for businesses, some organizations are turning to IP VPNs to support remote users who are constantly on the go. That's the case at Deloitte Consulting, which needs to securely keep 15,000 consultants connected to its corporate network while they are traveling around the world.

Deloitte decided to outsource its remote access because "it's extraordinarily difficult to manage remote access in-house," says CIO Larry Quinlan. "We're in 34 countries, and the consultants travel all the time. It's almost impossible to insource that type of support."

Deloitte uses Aventail.net Managed Remote Access Service that offers users access to corporate networks through a Secure Sockets Layer (SSL) client that runs on laptop computers. SSL provides 168-bit encryption over the Internet. While Aventail manages the remote-access gear deployed at Deloitte's headquarters in New York and monitors usage and performance, Deloitte uses WorldCom's remote Internet access support for network connectivity.

Aventail does not provide the network connectivity for any of its customers, but manages the VPN gear and end-user accounts, including intrusion detection, policy management and enforcement.

"We use our managed VPN service to handle the heavy lifting of remote access and also because it's a competitive advantage," Quinlan says. "We spend a lot of time at client sites so the ability of the Aventail service to go over firewalls, cable modem, DSL and private networks is a plus. We're also using this network to support some of our clients in an extranet environment."

While Aventail's service meets the majority of Deloitte's network needs, Quinlan would like to see support for IP Security along with SSL. Deloitte is also interested in using Public Key Infrastructure (PKI) and digital certificates, but both are "prohibitively expensive" from any provider, he says. PKI and digital certificates would add another layer of security to the company's IP VPN. ■



“We were investigating DSL and went pretty far down that path, but there were a lot of problems.”

Ray Pineau

Vice president of engineering and production, Captivate Network

"We can now capture our financials much more effectively day-to-day," he says. "Transactions at the chapter level ... now flow up to the national level right away."

The organization also has deployed videoconferencing over its VPN using gear from Polycom, a move that has reduced travel expenses by \$20,000 per year.

CFF's help desk also runs more efficiently since the IP VPN was implemented, August says. The help desk runs remote-control applications when working with employees on desktop issues. "Before it was like the blind leading the blind trying to figure out what was happening on a user's PC," he says.

Despite these benefits, an IP VPN service wasn't CFF's first choice. After exploring low-speed frame relay network services, CFF selected WorldCom's fully managed service because it was easier to support and more cost-effective, August says. "DSL to frame really wasn't there

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The Edge

■ SERVICE PROVIDER DEVELOPMENTS
AT THE JUNCTURE BETWEEN THE ENTERPRISE
AND THE NEW PUBLIC NETWORK

Short Takes

■ **Telica** and **Pactolus Communications Software** have teamed to support calling-card and conference-calling services in phone networks that use softswitches. The companies have announced that their implementations of Session Initiation Protocol are interoperable, meaning Telica's **Plexus 9000** packet-voice switch can be combined with Pactolus' **SIPWare Services** software to deliver calling-card and conference-call services. www.telica.com; www.pactolus.com

■ **Sonus Networks** and **SnowShore Networks** also are joining forces to support conferencing, announcement services and voice mail using packet-based technology. Sonus makes **Insignus Softswitch** and other packet voice gear and SnowShore makes **N20 Media Server**, which provides processing power for voice service applications. www.sonus.net; www.snowshore.com

■ **Laurel Networks** is introducing a new card for its **ST200** edge router for service providers that enables support for connections as small as 64K bit/sec. The card has two channelized OC-12 ports that can be subdivided into DS-0 links. It also can divide traffic into T-1 channels and can bond as many as 12 to make larger connections. The card is available now, but Laurel didn't disclose costs. www.laurelnetworks.com

■ A new study by **Gartner** says corporate interest in buying Ethernet services will increase dramatically. The research says customers will pay \$1 billion this year for such services and that number will quadruple by 2005. Low cost, high speed and users' comfort with Ethernet contribute to the rosy forecast, Gartner says. Major carriers will lead the way selling the services, given that start-ups that championed the technology, such as **Yipes Communications** and **Telseon**, have filed for bankruptcy protection, the report says.

Designing optical networks

Sycamore's applications plan for optical networks from metro to core.

■ BY TIM GREENE

CHELMSFORD, MASS. — Sycamore Networks is introducing enhanced tools and a new service to design and plan optical networks more quickly and accurately.

Additions to its Silvx InSight software family let network architects automate reporting and emulate design schemes to make sure they will work before being implemented.

These additions include a new application called Circuit Spy, more features for its existing Transport Design Application and InSight Design Services.

These offerings keep Sycamore near the top of network planning and design tools for optical networks along with Telium, says Andy McCormack, an analyst with Optical Strategies.

Circuit Spy software enables views of how network bandwidth is being used, so leftover capacity can be distributed. If a provider wants to lay in a new circuit between two cities, Circuit Spy will say whether the network can support the addition and what route the circuit will take. This procedure would reduce planning time and make installation of new circuits faster.

Transport Design Application, which checks the design of optical networks to make sure all the links will support the traffic meant for them, can now verify networks that include Sycamore's long-haul and ultra-long-haul switch, the SN10000.

MANs in paradise

Cable Bahamas uses Gigabit Ethernet for 'Net services.

■ BY PHIL HOCHMUTH

NASSAU, BAHAMAS — It is said that everything you could want is in paradise — sunshine, clear blue waters, soft island breezes, and now, high-speed Internet and Ethernet metropolitan-area network services for hotels, businesses and those lucky enough to call the Bahamas home.

The Bahama islands also have a \$4.5 billion-per-year economy, and are home to hundreds of "offshore" financial institutions and banks — businesses that traditionally had to buy high-priced satellite

Monitor circuit performance

Sycamore Networks' Circuit Spy software displays current status of optical circuits.

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Create Timestamp	Alarm Description	Severity	Acknowledged?	Time Acknowledged	Remarks
1/8/2002 10:18 40 AM	Circuit Up	CL	No	N/A	N/A
1/8/2002 10:18 40 AM	Protect Circuit Up	CL	No	N/A	N/A

The software investigates factors such as whether signal strength is great enough between sites, whether the proper amplifiers are used and whether dispersion is properly engineered. If it finds a flaw in a design, it lets users substitute a new design and verifies whether that will work.

"This helps to relieve operating expenses.

A lot of the network planner's time is spent in circuit design, and it's a very lengthy process," McCormack says.

The information could be exported to other applications, such as Microsoft Excel, to be shared by technicians in the field who need it but don't have Transport Design Application on their workstations. This export also eliminates errors that could be caused by manual transfers, which could take days to discover and correct.

Transport Design Application includes a new wizard that helps automatically generate chassis diagrams instead of manually doing so on a separate application. Generating the design diagrams by hand could take days. The diagrams show signal paths through each node, which could be sent to operators and installers in the field to reduce errors and decrease time to configure new services.

Sycamore says Transport Design Application can reduce planning time by 90%.

InSight Design Services puts customers in touch with Sycamore experts to draw on their experience using Sycamore tools.

All these products and services are available now.

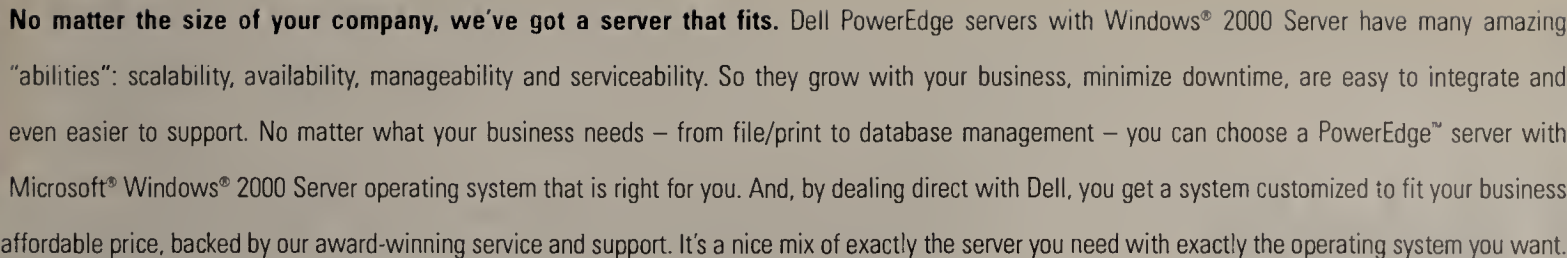
Sycamore: www.sycamorenet.com

See Bahamas, page 42

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Alcatel debuts seamless failover

■ BY TIM GREENE

PARIS — Alcatel claims to have new technology that will allow its core routers to fail without dropping sessions, a feature that the company says will relieve some of the delay problems facing carriers that provide pieces of the Internet backbone.

Called Alcatel Carrier Environment Internet System (ACEIS), this failover software will be available on some of Alcatel's existing hardware and new devices that will be announced by year-end. ACEIS can support 99.999% reliability, which is the reliability that is demanded by traditional telephone carriers, Alcatel says.

The company says ACEIS protects the main routing engine, which handles control-plane routing based on Border Gateway Protocol, Open Shortest Path First and Intermediate System to Intermediate System, the protocols used by Internet routers. This engine holds peering and reach-

bility information about routers in the network. If the engine fails, the router would have to be fixed and restored, leaving other routers in the network unable to connect with the part of the network associated with the downed router.

Without router reliability, service providers will be slow to adopt core IP networks to support high-availability services that can vie against frame relay or ATM, Alcatel says.

"[ACEIS] seems to be an example of Alcatel's ATM switch group putting its experience into routing," says Mark Seery, an analyst with RHK.

The technology also will be able to support more attractive service-level agreements for IP-based services.

Core router maker Pluris demonstrated a seamless failover on its TeraPlex core IP routers last year, but no other vendors have, Seery says. Alcatel says it will demonstrate ACEIS at SuperComm 2002 in Atlanta in June. ■

CommWorks gets its messaging act together

■ BY PHIL HOCHMUTH

SEATTLE — CommWorks last week announced a new messaging server aimed at allowing carriers to tie together voice and e-mail messaging for customers.

The CommWorks 8250 Unified Communications System, unveiled at the Voice on the Net show, is an IP-based server that combines voice mail, e-mail and fax messages on a single interface for end users. The 8250 could be added to a service provider's IP voice or "IP Centrex" service for business customers to add enhanced messaging capabilities, or for customers with public switched telephone network (PSTN)-based voice services.

The server supports Session Initiation Protocol, Signaling System 7, Post Office Protocol 3 and Simple Mail Transfer Protocol e-mail protocols, and wireless access protocol. These protocols allow the server to offer subscriber access to a unified voice, e-mail and fax mailbox from a company's standard e-mail system, such as Microsoft Exchange, Lotus Notes or Eudora. An internal Web server on the 8250 lets remote and traveling business end users access messages from a Web browser.

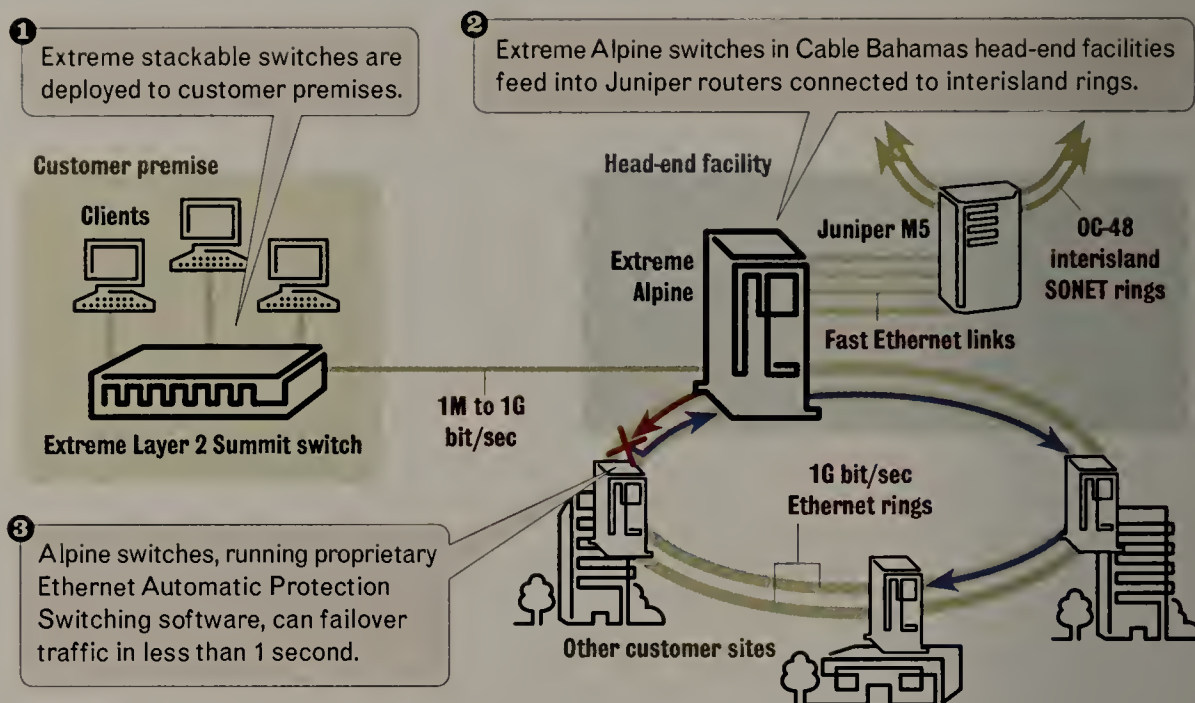
The 8250 server lets subscribers have one number for fax and voice messages and can convert faxes into image files that can be retrieved through a customer's e-mail account.

The server supports traditional analog and digital phones; SIP IP phones and mobile phones; voice mail subscriber features such as call monitoring and screening; the ability to return calls from inside a logged-on user account; and message alert signaling for mobile phone users.

The CommWorks 8250 is available to carriers now. ■

Metro Ethernet: No problem in the Bahamas

Cable Bahamas built out Gigabit Ethernet rings on the four major Bahama islands to offer Ethernet WAN services to customers.



Bahamas

continued from page 39

bandwidth service speeds on purpose," such as T-1 or 51M bit/sec, says Andre Foster, lead technical engineer. "We wanted to offer something different."

Last year, the company pursued business customers more aggressively and deployed a switched Ethernet MAN infrastructure from Extreme Networks. Before Cable Bahamas' offering, the local phone company, Bahamas Telecom Company, had a monopoly on WAN circuits for connecting sites on or among the islands, or for hooking to the Internet. Cable Bahamas also offered 300K bit/sec cable TV broadband services to residents and some hotels.

"Our goal was to build a telecom infrastructure to compete with the telephone company directly," Foster says.

His company now provides 1M bit/sec of bandwidth for about \$400 per month, while some business customers have paid \$15,000 per month for a single T-1 circuit from the phone company, he says.

"We looked at SONET stuff first, but it was extremely expensive," he says. "It also adds a layer of complexity that we didn't want to get into."

Cable Bahamas already had undersea fiber to provide cable TV service to the four major islands and had been building out fiber rings on the islands. Long-haul SONET gear was not

necessary for local-loop connection because for the most part they run less than 6.2 miles — the distance limit for Gigabit Ethernet over single-mode fiber. The company even used Gigabit Ethernet rather than SONET for one of its undersea fiber links, connecting Eleuthera to Nassau, because it is within Ethernet fiber range.

The cable company chose Extreme Networks' Alpine switches for its head-end "hub" facilities to light its land-based fiber. The Alpines serve as the MAN backbone, connecting hubs on each island in a ring topology (see diagram). The company has deployed 70 Extreme devices, Foster says.

“Our goal was to build a telecom infrastructure to compete with the telephone company directly.”

Andre Foster

Lead technical engineer,
Cable Bahamas

Layer 2 virtual LANs (VLAN) are used to identify customer traffic at the edge. Alpine switches in the central hubs feed into four Juniper M5 Internet routers, which sit on the cable company's OC-48 undersea SONET ring connecting the four islands.

The customer VLAN tags are matched with Multi-protocol Label Switching labels on the Juniper Networks boxes to keep traffic private and secure on the SONET backbone. SONET links

run to ISP Epic in Boca Raton, Fla., and MCI in Herndon, Va., providing the company's Internet backbone connection.

Cable Bahamas went with Extreme's gear over competing products from Riverstone Networks, Foundry Networks and Cisco. "What we liked about Extreme was that it was price-competitive, and it had the key features we wanted," Foster says.

One key feature the cable company required was the ability to control bandwidth on a per-port level at the customer premise. The hardware-based "rate-shaping" capability on the Alpine and Summit boxes give the cable company the ability to throttle bandwidth services from 1M to 1000M bit/sec. Riverstone and Foundry offered this feature at a higher price than Extreme, while Cisco did not offer rate limiting on its MAN products, Foster says.

The other requirement was the ability to create secure VLANs to separate customer data on the Layer 2 edge. "I can't stress enough the benefits of VLANs," Foster says. "That's what makes the [Ethernet MAN] service possible. We also liked the strength of Extreme's VLANs because of that — they don't leak data." ■

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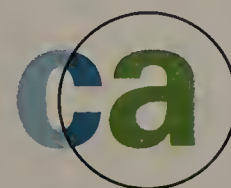
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Technology Update

■ AN INSIDE LOOK AT THE TECHNOLOGIES AND STANDARDS SHAPING YOUR NETWORK

Multimode wireless chipsets advance

■ BY STAN REIBLE AND DAVID MACDONALD

The next generation of wireless networks will involve multiple protocol standards, and a key consideration is that multimode chipsets can handle them all simultaneously. However, protocol candidates such as Wi-Fi, Wi-Fi5, HiperLAN, IEEE 802.11g and Bluetooth have different and incompatible operating conditions, so multimode chipsets will have to be developed to ensure compatibility.

A major problem is that wireless network protocols operate in different radio frequency bands. Wi-Fi, IEEE 802.11g and Bluetooth operate in the 2.4- to 2.483-GHz frequency band. Wi-Fi5 and HiperLAN operate primarily at 5.15 to 5.35 GHz. As a result, a transceiver's internal RF source must be able to "tune" over both frequency ranges and select the operating frequency channel.

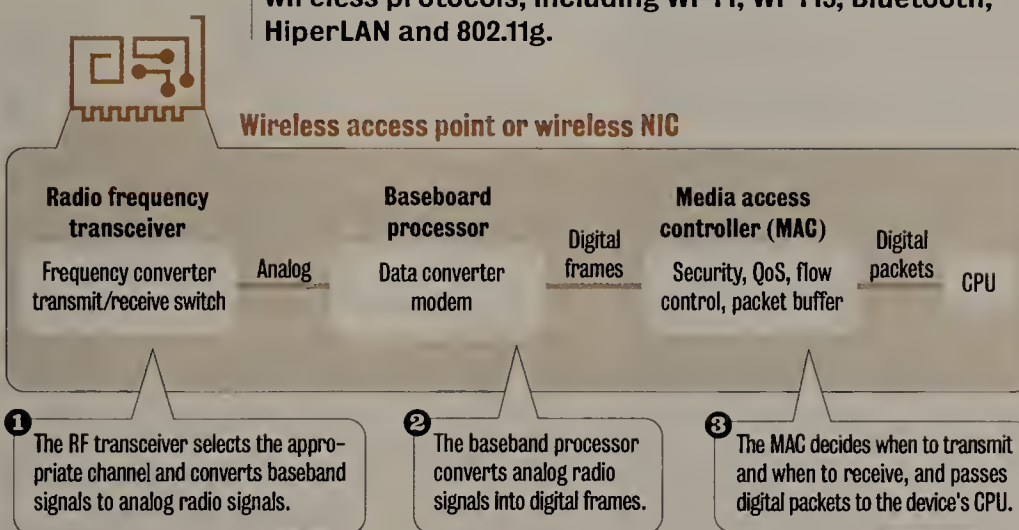
To complicate things, the Bluetooth protocol, based on Frequency-Hopped Spread Spectrum, requires 1,600 frequency hops per second over the regulatory-mandated frequency band using 1-MHz-instantaneously wide frequency channels.

Multiple modes can be daunting

The Wi-Fi protocol relies on single-carrier modulation to achieve both 11M and 5.5M bit/sec data rates. The Wi-Fi5 and HiperLAN protocols employ multicarrier modulation to achieve their higher 54M bit/sec data rates.

IEEE 802.11g employs Orthogonal Frequency Division Multiplexing (OFDM) for the 54M bit/sec rate and provides for Packet Binary Convolutional Code modulation as an option to deliver 22M or 33M

HOW IT WORKS



bit/sec data rates.

Bluetooth relies on Gaussian Frequency Shift Keying modulation to deliver 1M bit/sec data rates.

Baseband processor to the rescue

The principal functions of baseband processors are to generate the frequency hopping sequence, convert analog signals into digital data frames in the receive mode, and vice versa, in the transmit mode. In the receive mode, the first step is analog-to-digital data conversion. The digitized signals are then demodulated by the baseband processor.

The multimode baseband processor is also responsible for establishing necessary control functions, including timing and frequency synchronization over the radio frequency transceiver, and must do so within the time allotted, without knowing in

advance which modulation approach has been used in received signals.

Media access controller

A media access controller (MAC) is responsible for managing interaction with an air interface, deciding when to listen and when to talk, and passing error-free data packets to a terminal CPU. Because all the IEEE 802.11 standards essentially are based on using the same MAC, and the Bluetooth MAC is comparatively simple, defining a multimode MAC is not as challenging as the implementation of the corresponding radio frequency transceiver and baseband processor.

Chipset development challenges

The key piece in the design of a multimode wireless chipset is the radio frequency transceiver. The major functions of

the radio frequency transceiver are to select the transmit/receive channel, convert radio signals to and from baseband signals, and perform the necessary modulation and demodulation functions.

The transceiver translates internally generated baseband signals to a radio frequency, creating the desired waveform for transmission. On the receive side, it removes the radio frequency carrier from the incoming signal, leaving the baseband signals with the desired data.

To encompass operation in all protocols the radio frequency transceiver will need to have an radio frequency signal source agile enough for Bluetooth and with enough spectral purity for OFDM. The receiver will need to have enough sensitivity, and the transmitter enough power output to produce adequate range and have circuits with adequate dynamic range and linearity for providing IEEE 802.11a and 802.11g operation at the intended maximum data rates.

Providing the processing power (that is, a million instructions per second) and speed to establish protocol mode control within the time allotted without consuming excessive battery power is one of the most challenging requirements of multimode baseband processors.

The challenges at every level are difficult. But vendors are undaunted, and initial product releases have been forecast for as early as the third quarter.

Reible is vice president of Systems and Architecture at Global Communication Devices. He can be reached at sreible@gcdchips.com. MacDonald is director of marketing. He can be reached at david.macdonald@gcdchips.com.

Ask Dr. Internet

By Steve Blass

Over the weekend, hackers attacked our FTP site and created a directory with an illegal name of "AUX+./+/" that we cannot delete from the server. We shut down the FTP server for now.

These are the log file entries of the attack:

**wsftp70@ MSFTPSVC2 [13]MKD test 257 0 0 0
wsftp70@ MSFTPSVC2 [13]RNFR test 350 0 0 0
wsftp70@ MSFTPSVC2 [13]RNTO AUX+./+/ 250 0 0 0**

How can we get rid of the directory that

was created?

You may have been attacked to the point where need to do two things: 1) rebuild the FTP server from scratch using clean installation media, and 2) configure it to deny uploads and directory creation commands. You will find that you will keep getting scanned and attacked if you maintain a public Internet FTP server. That MSFTPSVC2 can create directories and files using illegal file names means you have to be careful when con-

figuring FTP upload services. This is true for any FTP server program. In the meantime, you may be able to delete the directory from a command prompt. Otherwise, moving the parent directory outside of the FTP server tree and copying back what you need could also fix the immediate problem.

Blass is a network architect at Change@Work in Houston. He can be reached at dr.internet@changeatwork.com.

GEARHEAD INSIDE THE NETWORK MACHINE

Mark
Gibbs



First, a correction regarding last week's column on XML Schema Definition. In the part about creating derived data types, we goofed. Eagle-eyed reader Will Wagers wrote to tell us of our error: "Surely, you meant -2 to the 63 to 2 to the 63 -1?" Surely we did. The moral is never edit by cell phone while driving at, ahem, 65 mph.

This week we promised XSD would get interesting when what we meant was "even more interesting"....

So by now you should have a pretty good idea of XSD's primitive (also called "basic") and derived data types. Just to make things even more gripping, that's not all! Oh no, XSD also has complex types that are derived from multiples and/or combinations of primitive and derived types.

This example is borrowed from a book we highly recommend: *Architecting Web Services* by William Oellermann Jr. (www.nwfusion.com, DocFinder: 8930).

XSD gets even more interesting

Oellermann covers a huge amount of ground in this book in as easily understood a manner as possible considering the inherent complexity of the subject.

While we're at it, we should mention another book that we rather like that attempts to ease you into the dark recesses of XSD and, indeed, many other things XML-related — *XML for the World Wide Web* by Elizabeth Castro (www.nwfusion.com, DocFinder: 8931).

Castro's book is not quite as detailed (or as long) as Oellermann's but has more examples that are more detailed, making it easier to understand the principles of XML, XSD and related technologies. We recommend getting both books.

So here's a complex type defined:

```
<complexType name="money">
  <simpleContent
    <extension base="decimal">
      <attribute name="currency" type="string"/>
    </extension>
  </simpleContent>
</complexType>
```

The complex type that we're defining is called "money," and it is based on the primitive type "decimal." But we need to add to the type an attribute that defines the currency — hence the "extension"

element.

This XSD specification applied to the following XML would pass validation:

```
<money currency="USD">123.45</money>
```

So far all we've done is just lightly scratch the surface of creating a schema using XSD, but you can see how definitions under XSD create templates for validating XML content.

We recommend that you check out the World Wide Web Consortium's XSD primer (www.w3.org/TR/xmlschema-0/), but you might want to read either or both of our recommended books first — the W3C stuff is beyond exhaustive.

A helping hand

As you can imagine, creating an XSD by hand would be very time-consuming and error-prone, but, fear not, there are tools to help you create and validate XML content against XSD specifications.

One of the most highly rated XML tool suites is XML Spy from Altova (www.xmlspy.com). XML Spy is for creating and validating XML schemas, Document Type Definitions (DTD) and documents. It presents you with an integrated development environment with multiple panes and automatically generates code in the background. You

can validate XML, DTD and XSD documents using the built-in incremental parser.

Most of the process of constructing something like an XML or XSD document is a matter of drag-and-drop and, where required, XML Spy can generate an Access database to support an XML document.

This is an awesome tool, but don't underestimate the steep learning curve that comes with such sophistication. Then again, XML and XSD aren't for technowimps anyway.

Another major player in this market is SoftQuad (recently swallowed up by Corel) with the XMetal product (http://shorterlink.com/?XZCU9Y).

XMetal was one of the earliest and most polished XML editing tools and the latest release, Version 3.0, includes XSD support. We have yet to get our hands on this product but it looks very promising (see http://shorterlink.com/?ASYIN7 for a full feature list).

Be all that as it may, next week we'll carry on with our tour through Web services technology.

So what are you doing with Web services? Spill your content to gearhead@gibbs.com.



Cool Tools

Quick takes
on high-tech toys
By Keith Shaw

Here are some more cool things we've been trying out recently:

IBM's A31 ThinkPad

We've installed lots of software on this IBM model, which came with a 1.6-GHz Mobile Pentium 4 processor, integrated 802.11b wireless, a DVD-ROM drive, large display area (15-inch TFT), 256M bytes of RAM, a 40G-byte hard drive and integrated 10/100M bit/sec Ethernet port. All this and more for \$2,674.

At 8.15 pounds, we thought it was a bit heavy for constant road warrior usage. IBM refers to the A series as "desktop alternatives." We see these being used in an office setting where you'd still want to be occasionally mobile (such as taking it home to finish work). One thing we found odd was the battery drain — at 50% battery life, the multimedia features (Windows Media Player) suddenly began to act like we were playing a 45-rpm

record at 33 rpm or slower. The normal sound of the music didn't come back until we were at full charge again. More information can be found at www.ibm.com/products.

Altec Lansing's 4100 4.1 Speaker System

If you've got an office and really want to rock the house — and still be stylish — the 4100 system can't be beat. For only \$200, you get four attractive speakers and a subwoofer, plus a very sleek wired remote for increasing the volume after hours for your gaming endeavors. It's a good price for speakers of this quality.

The speaker system also works with any device that has a 3.5mm headphone jack, so it can be used with your Playstation 2, MP3 player or other devices.

Installation was as easy as connecting the color-coded speaker cords to the base of the subwoofer and then plugging the subwoofer into the headset jack of the computer. Head to www.nwfusion.com, DocFinder: 8929, for more information on the system.

Laptop stands from Lapvantage

If you take your laptop home or you're on the road, two models from Lapvantage.com may help. The \$30 Ergo Edition is a laptop stand that raises your notebook to eye level to reduce eyestrain, back

Lapvantage's laptop stand could improve your ergonomics.

pain and shoulder pain (looking down at a notebook creates strain). It includes a cubbyhole in the back of the stand to let you store attachments such as Universal Serial Bus hubs. While the stand is not heavy, the bulk may prevent a mobile

worker from bringing it on the road.

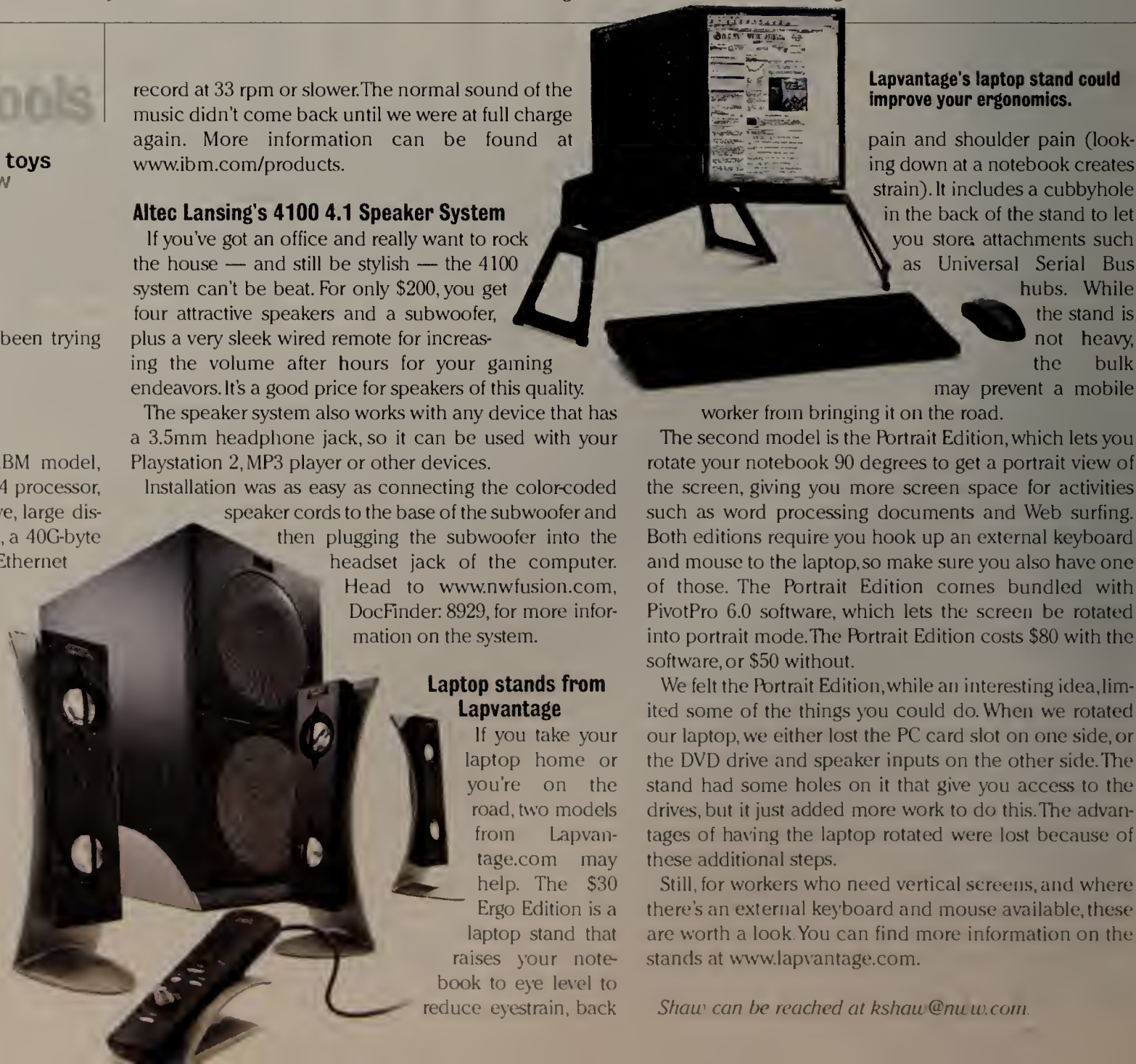
The second model is the Portrait Edition, which lets you rotate your notebook 90 degrees to get a portrait view of the screen, giving you more screen space for activities such as word processing documents and Web surfing. Both editions require you hook up an external keyboard and mouse to the laptop, so make sure you also have one of those. The Portrait Edition comes bundled with PivotPro 6.0 software, which lets the screen be rotated into portrait mode. The Portrait Edition costs \$80 with the software, or \$50 without.

We felt the Portrait Edition, while an interesting idea, limited some of the things you could do. When we rotated our laptop, we either lost the PC card slot on one side, or the DVD drive and speaker inputs on the other side. The stand had some holes on it that give you access to the drives, but it just added more work to do this. The advantages of having the laptop rotated were lost because of these additional steps.

Still, for workers who need vertical screens, and where there's an external keyboard and mouse available, these are worth a look. You can find more information on the stands at www.lapvantage.com.

Shaw can be reached at kshaw@nwfusion.com.

Altec's stylish speaker system is priced right.



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EDITORIAL

John Dix

Getting down with the VON Showdown

There was some good back and forth at our Network World Showdown on IP PBXs at the Voice on the Net conference last week in Seattle, with vendors fielding questions about everything from system readiness to system architecture.

In the first segment, representatives from Avaya, Alcatel, Nortel, 3Com and Shoreline Communications answered questions put forward by yours truly and co-host Mike Hommer, manager of lab testing at Miercom, a member of the Network World Global Test Alliance. Then it got a little more feisty in Round Two when the vendors got to ask each other questions.

Barry Castle, Shoreline's vice president of marketing, asked Nortel why it was simply layering IP on top of its existing PBXs. "Isn't that a short-term fix to hold off the market? Like Digital Equipment's move in the late '80s to run Novell NetWare on the VAX to slow the migration to PCs?"

Ouch.

And Alcatel's Rudy Mazza, marketing director of the voice launch team, asked Avaya's representative, "If I want to use one of your new IP gateways, will I have to perform a brain transplant on the Definity?" Jorge Blanco, director of Avaya's Enterprise Telephony strategy and planning, answered, "Yes, you have to do a lobotomy. You have to swap in a Linux-based processor, but you can keep 85% of the cabinetry."

And so it went.

All this may have been falling on skeptical audience ears, because in a presentation earlier that day Henry Sinnreich, an executive staff member at WorldCom, dismissed all IP PBXs as "Internet-unaware." He said the gear is centrally controlled, proprietary, offers no Web integration and lacks second sources for components such as phones.

True innovation and integration can't be achieved until the industry embraces phone systems based on Session Initiation Protocol (SIP), Sinnreich said. And indeed, the SIP battle cry was heard repeatedly throughout the show.

Among other things, SIP support promises interoperability, lower cost and, most importantly, extensions to e-mail, instant messaging and the Web. The Windows Messenger bundled into Windows XP, for example, is based on SIP.

While many technical and practical obstacles stand in the way of SIP nirvana, many speakers — even from the traditional PBX vendors — agreed that SIP is the future for converged systems. It is just a question of how do you get there from here and how long will it take.

Those questions went unanswered.

— John Dix
Editor in chief
jdix@nww.com

Product pros and cons

Regarding your Buyer's Guide to network management software suites (www.nwfusion.com, DocFinder: 8924): We just finished an extensive trial of Entuity's Eye of the Storm (EOTS). The best feature of this product is how it helps manage Layer 2 — it ain't just another router tool. EOTS is one of the best switch management products around.

Also, you say that users can create their own custom reports, but the reports in EOTS are pretty much canned. But having said that, it's got one of the best graphing interfaces I've seen, bar none.

Finally, it seems your reviewers are reluctant to say anything negative about these products. I've been an administrator of Aprisma Management Technologies' Spectrum for about three years. Why don't you point out the "hood welded shut" nature of Spectrum? For example, an administrator can't close alarms in the spectrum console — the only way they get closed is if the underlying problem is resolved.

John Chapin
Network management specialist
Alliance Capital
New York

Thank you for providing a midtier network management product review ("Tightly focused network management suites," www.nwfusion.com, DocFinder: 8925). It's common to see the "big guys" written up — if only everyone could afford them and the staff to go with them! Also, your choice of scoring categories are right on target.

Becky Bouwman
Vice president
3dB Global
Gaithersburg, Md.

E-mail letters to jdix@nww.com or send them to John Dix, editor in chief, Network World, 118 Turnpike Road, Southborough, MA 01772. Please include phone number and address for verification.

Experience wanted

I am truly delighted by your article on IT internships (www.nwfusion.com, DocFinder: 8926). I am a newly qualified Cisco Certified Network Associate and am studying to become a Cisco Certified Internetwork Professional. I am hungry for experience and struggling to find a place to gain it — offering in return to give away my energy and skills for free, if need be.

You have provided soothing balm to the aching IT conundrum of the newly skilled — no job, no experience; no experience, no job. Apart from a few laudable initiatives, the concept of internship is unheard of in South Africa, and it appears we are not entirely unique in this. Thanks for promoting this idea to management in such a creative and proactive way.

Vaughan Beckerling
Cape Town, South Africa

Gender shouldn't matter

In the News Bits section of your March 25 issue, you announce that the Internet Engineering Task Force selected a woman as chair of the Architecture Board. You gave this action a "halo," supposedly because appointing a woman was somehow good. Why this action is good simply because a woman was chosen escapes me. I hope she was selected for some level of her personal merit, but your note only pointed out that she was a woman and omitted any reference to qualifications or accomplishments.

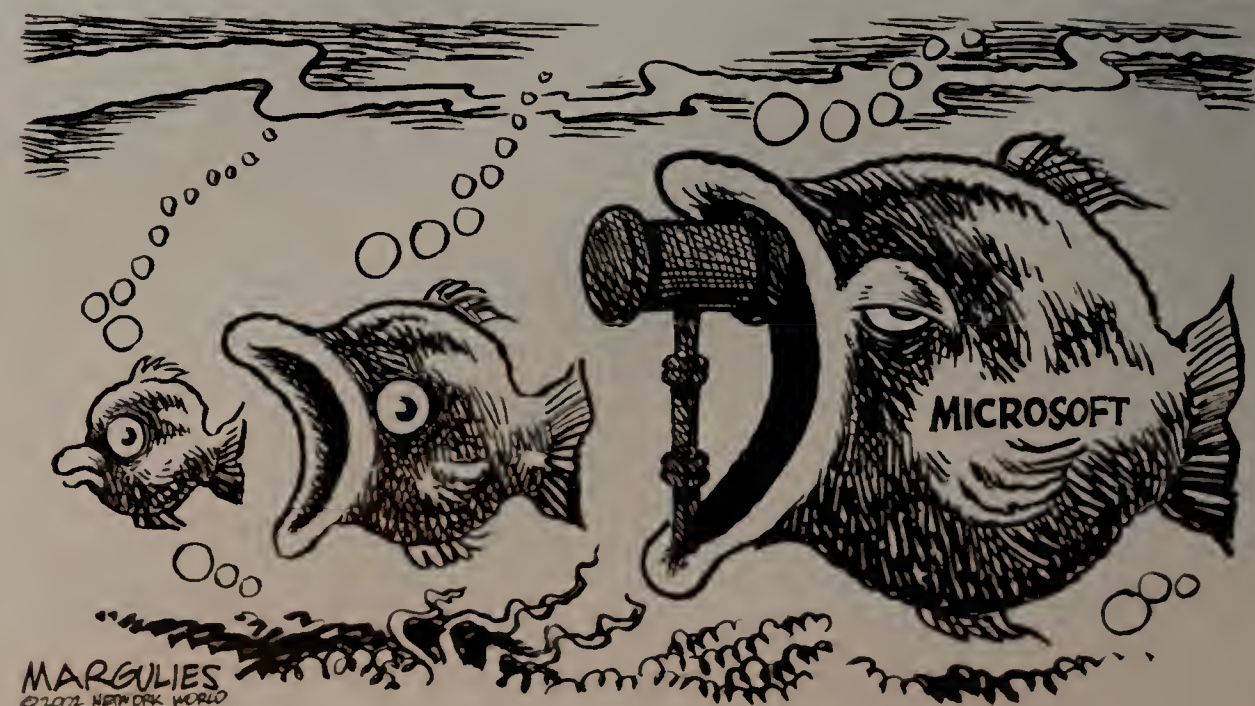
I hope that the IT industry will not follow the error of other groups by politicizing opportunities to suit a misconceived social engineering agenda.

J. Tyler Balance
Syracuse, N.Y.

Editor's note: While the briefs section only allowed for us to give a short take on Daigle's appointment, a more complete review of her accomplishments is available at www.nwfusion.com, DocFinder: 8928.



More online! www.nwfusion.com Find out what readers are saying about these and other topics. **DocFinder: 8922**



TECHNOLOGY AND GOVERNMENT

Deb Mielke

There is not one facet of U.S. government, business or the personal lives of each and every citizen that is not touched by technology. National defense, tax collection, Social Security and Medicare, and even our immigration and electoral systems all rely on the computing platforms, software and communication networks and services. Business executives are well aware of their companies' reliance on technology to conduct business-to-business and business-to-consumer transactions (remember the Y2K scare?). Few of us would be willing to give up our home computers, PDAs, telephones, Internet access, cell phones, cable or satellite TVs and all the other electronic gadgets that have become invaluable to meeting our personal and business commitments.

But despite the obvious critical nature of technology in our lives and its contribution of more than 15% to the gross domestic product (a conservative estimate), the government's knowledge of, and interaction with, this important sector of the economy has been piecemeal at best. The executive branch needs at least one point where technology issues can be viewed as a whole. That point should be a government technology czar.

Much like the recently created director of homeland security position, the technology czar would serve as an interdepartmental knowledge transfer point within the government, adviser to the executive branch on technology issues and spokesperson for the government on technology topics. Additionally, the czar would function as an industry advocate, ensuring that U.S. technology maintains its leadership position in the global economy.

The case for a technology czar

The executive branch needs at least one point where technology issues can be viewed as a whole.

tion in the global economy.

In the current government/business environment, the technology czar could address such cross-disciplinary issues as the economic benefits, technological innovations, tax implications, financial and physical security, and individual privacy questions surrounding the burgeoning e-commerce sector. Or the czar could look at how wireless and location-based technologies could be used not only to provide interesting new business and consumer services but also to enhance the capabilities of government agencies to respond to emergencies more rapidly. Lastly, the czar could ensure that the U.S. maintains its leadership in technology innovation by ensuring that regulation does not impede nor add intolerable cost to leading-edge products or services. If this doesn't appear to be a problem right now, IDC predicts that U.S. companies, currently spending \$5.5 billion on offshore outsourcing, will spend \$17.6 billion offshore by 2005. How many jobs and what percentage of venture capital dollars will follow?

The appointment of a technology czar would focus the efforts of individual governmental departments and the industry on problem resolutions that do not fix one issue (online privacy) while creating others (collection of tax revenue). More importantly, the high-tech czar would signal our government's commitment to the high-tech industry and its continuing leadership in innovation and economic growth.

Mielke is managing partner of Treillage Network Strategies, a consultancy in McKinney, Texas. She can be reached at dmielke@attbi.com.



INDUSTRY COMMENTARY

Frank Dzubeck

As I look back over the past year, I see the communications industry in a state of depression, not recession. The underlying factor in this dismal economic situation is lack of capital. Service providers are plagued by bankruptcy filings (35 to date) and reduced capital expenditure budgets. Equipment vendors, which are symbiotic with service providers, are affected by the resulting loss or postponement of sales. Exacerbating the situation is the general downturn of the economic climate, which is forcing many companies to contract. This equates to a "triple whammy" for an industry that already was seeing aversion to risk.

What went wrong?

Two years ago the communications industry was in a remarkable growth phase, creating competitive opportunities for ISPs, competitive local exchange carriers and optical backbone interconnect suppliers, among other businesses. E-commerce, e-business and Internet applications fueled the demand for bandwidth. The dot-com craze was in full force. Corporate valuations, venture investment, IPOs, and mergers and acquisitions were at an all-time high.

There were numerous causes for the industry's downward spiral — the first being greed and the expectation of easy money through IPOs of companies that were "before their time." The second reason for the decline was that many service providers and equipment/software vendors relied on poor business cases to generate profits and drive corporate growth. The third reason was the tendency of stock buyers and the investment community to follow a herd mentality rather than using common sense. The final reason was the coup de grâce that killed an industry — panic, fear and revenge.

How do we get out of this mess?

The simple answer is for the capital industry to return to sanity. But that is not enough. Investors are looking for opportunities that promise a return on investment and offer an exit strategy. To succeed, a business equation must link buyers and vendors with investors. In the communications industry, this means bringing together network-based appli-

Turning an industry around

cations that drive bandwidth demand from consumers and companies of all sizes. The emergence of streaming video and, in the future, grid computing as applications seems to be the answer: bandwidth generators of the first magnitude. From the sharing of DVD movies by consumers to the use of e-learning by corporations and government, streaming video has come of age. This, coupled with industry-specific video applications and video chat, will produce ever-increasing bandwidth demand by consumers and corporations.

If the applications exist or soon will exist to drive bandwidth demand, then according to communications industry philosophy, service provider build-out must occur ahead of the demand. Here we run into the Catch-22 conundrum facing the industry in 2002: the lack of capital required to build out networks in expectation of demand. Without significant capital expenditures, customer bandwidth access and metropolitan backbone bandwidth will not exist to meet real-time video application and grid computing requirements. Until we solve this problem, growth will not return to the communications industry.

Recently in Washington, industry executives have lobbied for the government to step in and assist the industry through Universal Broadband Access initiatives that guarantee broadband access to all consumers and businesses in the U.S. The intent would be to add a surcharge to all ISP and broadband connections or content services for universal service. The fund would be administered to let wireline, wireless and cable providers build out their networks to increase broadband access.

Whatever the external stimulus, something must be done to return economic viability to the industry in the eyes of the capital markets and the investment community. The communications industry cannot get the financial traction to do this itself without a return to the world of noncompetitive regulated monopolies — an alternative that everyone agrees is not an answer to the problem.

Dzubeck is president of Communications Network Architects, an industry analysis firm in Washington, D.C. He can be reached at fdzubeck@commnetarch.com.

To succeed, a business equation must link buyers and vendors with investors.

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NetworkWorld **SECTOR** **SPOTLIGHT**

How emerging technologies
are transforming key
vertical industries.

Ethernet takes control of the factory floor

Manufacturers are replacing legacy control networks with industrial Ethernet to save money and boost performance.

■ BY CAROLYN DUFFY MARSAN

Shell Deer Park Refining announced in February that it would spend \$12 million upgrading the automation systems at its petroleum refinery outside Houston. By fall, the refinery — which can process 340,000 barrels of crude oil per day — will boast new, cutting-edge instrumentation and controls that take advantage of high-speed industrial Ethernet.

The Deer Park project is one of several industrial Ethernet deployments launched by Shell Oil and its joint ventures. For example, Shell Oil is building a massive chemical plant in the jungle of Nanhai, China, featuring the latest automation technologies including industrial Ethernet.

Industrial Ethernet refers to the use of standard Ethernet chips, components and wiring on manufacturing networks to replace older, special-purpose protocols. By deploying the technology, Shell Oil is dramatically reducing the cost of network hardware used in its plants. At the same time, Shell benefits from faster performance, simpler networks and improved information sharing between manufacturing and back-office systems.

Shell Oil isn't alone. A growing number of manufacturers including General Motors, Great Dane Trailers, Western Kentucky Energy and Syncrude Canada are deploying industrial Ethernet to control their machinery.

"There's a tremendous amount of activity going on in industrial Ethernet," says Chantal Polsonetti, a vice president with ARC Advisory Group, a market research firm that specializes in manufacturing automation. The standards bodies that specialize in manufacturing networks have released their own industrialized versions of Ethernet that integrate with the older, proprietary protocols while meeting the stringent safety and security requirements of manufacturing environments.

At the information layer, industrial Ethernet allows companies to pull data off a manufacturing line and feed it to enterprise software such as asset management and inventory control applications. This real-time data is made available via a Web browser to anyone in the company for remote monitoring and diagnostic purposes.

The next step is for industrial Ethernet to carry real-time communications between controllers of the sensors, push buttons, motor starters and other devices on manufacturing lines. Instead of installing three different network cards on each device to support separate information, control and device networks, a manufacturer can install a single industrial Ethernet card, thereby cutting the cost and complexity of its plant network.

Polsonetti says most industrial automation suppliers are shipping controllers with

Ethernet capabilities, whether or not that capability is used. She projects that 4.7 million Ethernet-enabled controllers will be shipped in 2005, up from 116,000 in 2000.

"As long as you adhere to the mantra of intelligent implementation, it makes a lot of sense to go with industrial Ethernet for control," Polsonetti says.

That's what Basic Machinery, a Siler City, N.C., maker of manufacturing equipment for the brick industry, learned when it began designing a new \$1.7 million machine for sorting and stacking bricks. The company's new de hacker, which was delivered to its first customer last month, uses Ethernet for its information and control systems.

"Ethernet gives us the speed we need, which is 100 megabits per second," says Joey Boswell, project manager for control engineering at Basic Machinery.

Boswell says alternative protocols are either much slower than industrial Ethernet or require more expensive components and wiring. Basic Machinery is using standard, off-the-shelf, twisted-pair Ethernet cables in its de hacker, which weighs 32 tons and is as large as half a football field.

"Where Ethernet really shines is that every one of my [input/output] devices is Web-enabled, which gives me diagnostics right at the machine's nerve system," Boswell says. "That's something that all these other proprietary bus networks cannot give you."

Users can enter an IP address for any of the machine's 700 I/O systems into a Web browser to access reams of real-time diagnostic information about that device. Boswell says this feature helped sell the de hacker to Pine Hall Brick, of Winston-Salem, N.C. "This is the first use of an Ethernet control system in the brick industry," Boswell says.

One potential stumbling block for industrial Ethernet deployments in control systems is fear of security breaches. The older three-tiered manufacturing networks — with separate information, control and device-level communications — offer security advantages by keeping the different types of network traffic physically separated from one another.

Flattening these networks into a single industrial Ethernet backbone — while cutting costs dramatically — has some inher-

ent security risks, experts say.

Security concerns are one reason that Syncrude is not yet deploying industrial Ethernet to control the sensors in its oil mining facility in Fort McMurray, Alberta, Canada. Instead, Syncrude uses industrial Ethernet to pull historical data off the control systems for use in its laboratory and simulator. Syncrude mines 500,000 tons of sand per day to extract oil for refining.

"We've been using the industrial Ethernet network for about four or five years," says Ian Verhappen, an engineering associate with Syncrude. "We were one of the first adopters of the technology."

Syncrude's 100M bit/sec industrial Ethernet backbone connects several control systems to each other, but it isn't used to control the machinery. Syncrude has firewalls set up between the control system and the industrial Ethernet backbone, and between the industrial Ethernet backbone and the corporate office automation network.

MANUFACTURING: AT A GLANCE

- The manufacturing industry contributed \$1.5 trillion to the gross domestic product (GDP) in 2000, according to the Bureau of Economic Analysis.
- From 1992 through 1997, GDP in manufacturing grew by 5.2% annually, compared with 3.1% for the economy overall, according to the National Association of Manufacturers.
- Gartner's 2001 Spending Survey shows that the average IT budget as a percentage of revenue is 2.76 for discrete manufacturing in 2002. The percentage for process manufacturing is 1.61.

Still, Verhappen says Syncrude eventually will use its industrial Ethernet backbone for more applications, if not direct control of machinery. For example, Syncrude is rolling out real-time video of key manufacturing processes on the industrial Ethernet backbone.

The biggest challenge Basic Machinery and other manufacturers face with industrial Ethernet deployments is finding automation engineers familiar with Ethernet, which traditionally has been an office technology.

Most deployments of industrial Ethernet are retrofitting existing machinery vs. the outfitting of so-called greenfield, or new, plants. But that trend may shift as the manufacturing sector pulls itself out of an 18-month slump.

"There are not a lot of greenfield activities going on right now," says Doug McEldowney, strategic marketing manager for Rockwell Automation Control and Information Group, which sells Ethernet-enabled information and control systems. "But that's where we believe the boom for industrial Ethernet is going to be." ■



More online!

- Learn about several industrial Ethernet standards under development.

DocFinder: 8921



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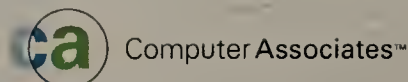


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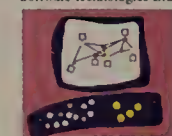


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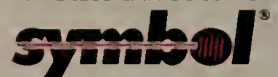
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Continental Airlines has high-flying plans to expand its e-business infrastructure to Europe and Asia this year, and global load balancers are playing a pivotal role.

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In fact, says Andre Gold, director of Internet engineering at Continental, "If the [global] load-balancing technology fails, we fail. Our entire e-business strategy is based on this technology."

Global load balancers use a number of different techniques to direct Web traffic to the most appropriate server farm or data center. Unlike server load balancers, which manage traffic within a company, global load balancers manage traffic between geographically distributed sites.

The Houston airline uses two

LinkProof traffic management appliances from Radware to juggle traffic between its two ISPs – WorldCom and Savvis Communications. The ISPs support the airline's busiest Web sites: those that provide frequent flyer information and handle online booking. The global load balancers monitor the performance of both ISPs' networks and shuttle Web traffic from Continental data centers back to the customer through the fastest route.

This improves the efficiency of Continental's e-commerce site, which means customers can obtain information or book a ticket faster than before. Gold estimates that the performance improvements have let Continental shave \$20 off the price of a ticket.

This year's e-commerce data center expansion will hinge, in large part, on an upgrade to Radware's Web Server Director-Network Proximity appliances, which will give the airline the ability to redirect customers to the "closest" server using a customizable algorithm.

Andre Gold of Continental Airlines is counting on global load balancers.

How global load balancers work

Global load balancers use proprietary protocols to collect information about the health of a site or to derive basic location information, says Peter Firstbrook, an analyst at Meta Group.

Although there is some support for exchanging metrics between global load balancing gear using XML, Firstbrook says communications between devices are not expected for a few years, so customers are better off sticking with one vendor for traffic distribution.

Today's global load balancers divert traffic

using one or more of several techniques

- Most common for Internet applications is DNS redirection, in which the global load balancer becomes the authoritative name server. In this scenario, client URL queries traverse Internet DNSs until the IP address of the global load balancer is returned. The appliance then gives the client the IP address of the best data center.

One disadvantage of DNS redirection is that it

is time-sensitive. The appliance might not have the most up-to-date information on the status of each server or database. But DNS redirection is relatively fast and easy to deploy and requires less system intelligence than other methods.

- DNS redirection is often used in conjunction with HTTP redirection. This method sends traffic to the most available site based on HTTP header information. It's also considered quick to implement, but the downside is that it's only good for

HTTP traffic, not for FTP streaming, for example.

- Triangulation is another DNS method that works when the client sends out a request, which is shipped to multiple sites that mirror the requested content. The best available server sends back data the fastest. Radware uses a triangulation method where the load balancer directs traffic to the least congested site, while masking that address with the address of the redirecting site.

Global load balancers don't solve all problems

If you need to deliver cacheable data more efficiently and cost-effectively to customers, then a content delivery network (CDN) might be your best bet. A CDN will reduce the amount of traffic hitting a server by moving frequently requested content to the network's edge, says Zeus Kerravala, an analyst with The Yankee Group.

But if you need to handle frequent requests for transaction applications, it's more useful to balance and direct traffic between data centers, because that type of data is not easily cached.

Cendent Mortgage in Mt. Laurel, N.J., has 100 different Web sites across its divisions that are used by individuals seeking mortgage and financial information. Jim New, an advanced technical services specialist at Cendent, says even though the price tag on Cendent's load balancing rollout is about \$240,000, the cost is well worth it.

"We can handle about 10% more requests than we otherwise might," New says. "We can also take down servers if necessary to update them without affecting availability."

The company has two global load-balancing appliances from F5 Networks, which both sit outside the firewall. The appliances translate external IP addresses to an F5 Big-IP controller, which routes IP traffic to the best server. Cendent has data centers in Mt. Laurel, Moorestown and Garden City, N.J.

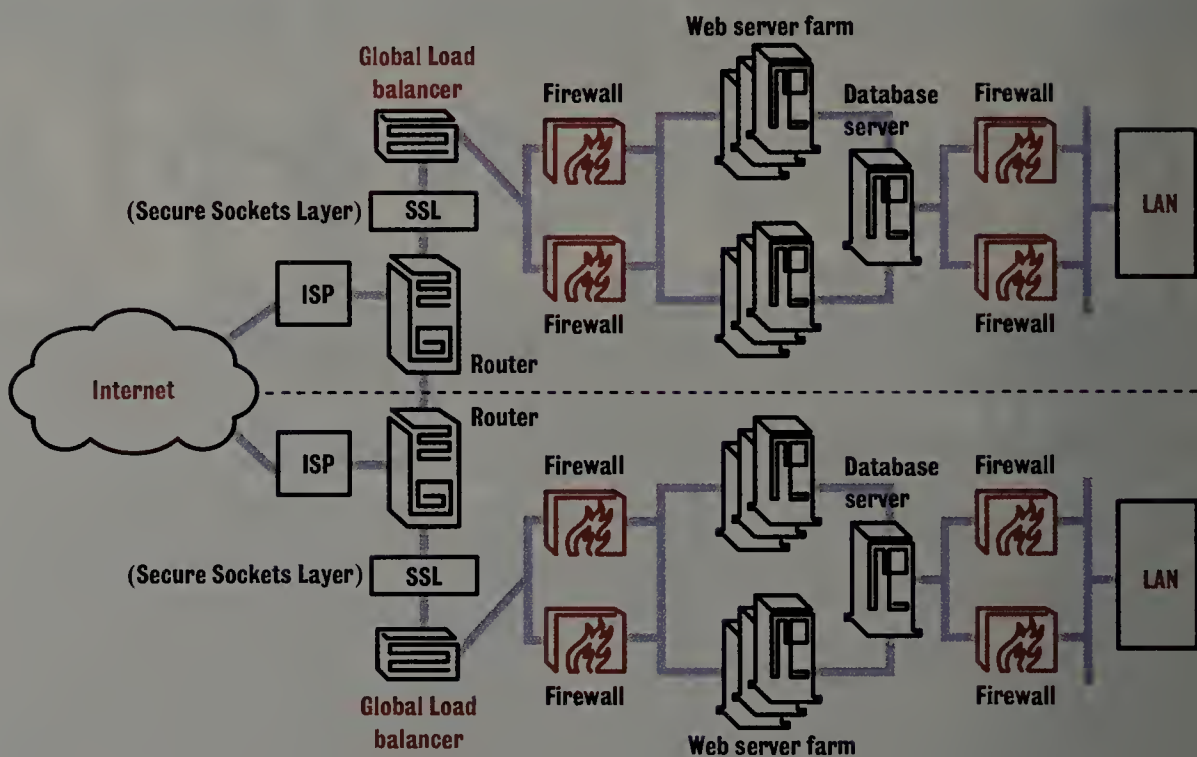
It's not always easy to nail down specific monetary figures to show where global load balancing delivers value. But many corporations are happy knowing they have more control over what's already in their network.

The Web servers at Landstar Systems, a transportation services company, are the most important means of communicating with more than 10,000 employees who work for about 1,000 Landstar agents. These are owners, operators and contractors who log on to Landstar's site each day to conduct business.

The company distributes network traffic to 15 servers in data centers in

Global load balancing at Continental Airlines

Global load balancers will direct Web traffic to the appropriate server



Jacksonville, Fla., and Rockville, Ill., using two Radware switches — a WSD-Distributed Solution to ship traffic to either data center, and a WSD NP, to direct traffic to the closest client.

Patrick Wise, vice president of e-commerce at Landstar in Jacksonville, says he has no statistics to prove he is saving money, but by redirecting traffic to an under-used Web server, he avoids having to add an extra server.

More important to Landstar is that it can remove a failed server from a cluster without customers ever knowing. Another benefit is it lets Landstar see potential bottlenecks. "We can manage our site better and control our load better," Wise says.

Some predictions about GLB

2001-2002 — The number of organizations adding multiple data centers is increasing and by 2003, about 70% to 75% of mid- to top-tier applications will be distributed across at least two data centers.

2001-2004 — Prices for load-balancing products will gradually decline 10% to 15% annually.

2002-2003 — Global load balancers and local server load-balancing products will incorporate wireless protocols as growth of all wireless access devices accelerates.

Source: Meta Group

Looking ahead

Near-term advances will focus on improving each device's overall ability to check the health of an application.

F5 Networks plans to enrich its ability to control traffic so that users create localized custom topologies. IT managers can route traffic on a country level, but soon will be able to drill down on a more specific geographical level, says Jason Needham, a product manager at F5.

The company also will improve its "persistence" features, which control the ability to make sure users who input data on one screen can be routed back to those locations. This is particularly important in a financial application, when a customer fills out an online credit card profile, for example. The ability to synchronize that data with other data centers in real time is something that F5 will address this quarter.

Cisco also will improve the geographic accuracy of where content is best reached for fastest response. In particular, companies will be able to update a database to identify content that is cached on a particular local device and not just at an origin server.

But the next challenge will occur when corporations want to conduct fulfillment activities out of multiple servers across more than one data center. That will make it necessary to synchronize databases across the company, says Thomas Nolle of the CIMI Group and a *Network World* columnist.

"Most applications today are designed to load balance a display-only Web server, rather than really support load balanced e-commerce where there is a transaction and not just a cataloged Web page," Nolle says. "But ultimately the value of an electronic catalog is limited if you cannot execute off of it."

There is a lot to distributed load balancing that has nothing to do with networks and everything to do with the overall framework of the applications, Nolle says.

Global load balance bits

- Aside from F5 and Radware, other players are Cisco, through its purchase of ArrowPoint Communications; Nortel, through its acquisition of Alteon WebSystems; and Foundry Networks.

- Vendors differ on how they measure the capacity of global load balancers. Some use throughput, others talk about connections per second. The important thing is having a device that can scale up to handle peak numbers of requests coming in to the data centers, Yankee's Kerravala says.

- Global load-balancing appliances generally sit outside a network and catch requests before they hit the firewall, although there is flexibility in how they can be installed, and in some cases they can sit between the firewall and the servers.

- Most vendors sell more than one box to handle the actual load balancing and traffic distribution, although there are products that combine the functions.

It's not so important how a company chooses to handle the task as long as the ultimate goal is achieved. "It's more important that Web transactions are happening as quickly as possible," Kerravala says.

Semilof is a freelancer writer living in Watertown, Mass. She can be reached at msemilof@attbi.com.

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NetworkWorld Review

RouteScience's PathControl

■ BY GREG GODDARD AND RYAN VAUGHN

Making the most of your outgoing BGP routes

RouteScience's PathControl can help your data get to where it's going faster. This device optimizes outgoing Border Gateway Protocol routes by measuring the latency across site-to-site Internet connections. Our lab tests showed PathControl monitors the delay found in each ISP connection network and then ensures data is sent along the most available routes. PathControl's strong performance in our tests, easy-to-use interface and extensive set of BGP features combined to earn our World Class Award.

In any multihomed Internet environment, the network router will receive multiple routes for the same destination network. The BGP routing algorithm computed by an Internet router determines the best egress route by comparing default attributes in a specific order for each route, from each provider, until a best path can be determined. In a situation in which all the metrics are identical, the best path selected is the route with the lowest BGP router identification number.

Because BGP does not take into account link congestion or the difference in delay among multiple ISP connections, a product such as PathControl increases the likelihood that end users will get the best connection possible. We tested the 14-slot version of PathControl that supports up to 10 peerings and found it will increase the likelihood the Internet router will select the route with the lowest latency.

PathControl ships with three modules. The engine stores live measurements and runs the BGP routing process. The management module serves up a Cisco-like command-line interface that lets a user configure the other modules. The user statistics (USTAT) modules measure the handshake round-trip time (HRTT), which is the time it takes for a host to complete a TCP handshake.

An optional reporting module, which costs \$35,000, mirrors the data stored on the engine module and produces comprehensive summary and trending reports via a Java-based front end. With the reporting module, a user can see which Internet links perform the best over time and the percent optimization improvement.

Passive mode lets the user test the product without interfering with outgoing BGP

routes. In active mode, the PathControl device makes decisions regarding outgoing BGP routes based on configured parameters.

We tested PathControl using a network that simulated peering with two external BGP providers (see How we did it at www.nwfusion.com, DocFinder 8827). We introduced 300 msec of latency and 25% frame loss into the default BGP preferred path. The Cisco 7206 box we used as our Internet router still preferred the degraded connection. But PathControl determined that an alternate route existed via another ISP.

PathControl made this determination by measuring the HRTT between its USTAT modules and the end user across both ISP connections. PathControl advertised the preferred route by adding a higher weight to the route through the other ISP to the Cisco 7206 router. When the latency and packet loss were removed from the network, PathControl adjusted the preferred route back to the original default egress path on the Cisco 7206 router.

In a multihomed Internet environment, one of the Internet connections often will be more utilized than others. As a content provider's overall utilization increases, more load is placed on the already heavily utilized link, and at some point this would require a bandwidth increase. The monthly price per megabit of Internet connectivity is very expensive, so in a situation like this the user would be adding bandwidth to one ISP connection while the other ISP connections still have unused bandwidth. A device like PathControl, although it is very pricey, could be worth the investment because it allows for even distribution of outgoing traffic over multiple ISP connections.

For PathControl to be used in a production network, a small graphic is placed inside the Web page that an end user is trying to access. This is the mechanism by which PathControl initiates its HRTT measurements. Because this is a very small file, we found no adverse effects to the network or the user by placing it on multiple Web pages.

We don't feel PathControl would be good to use on an ISP link used predominantly to deliver streaming media content. Content providers that use third-party distributed content caches would need to make sure that the file was not placed on any Web page that is to be cached. If a caching engine serves the file, no request is generated to PathControl, so no HRTT could be measured for route optimization by PathControl. RouteScience says it is working on a way to resolve this issue.

PathControl also includes options that can be used to improve BGP routing decisions. We tested the penalty value, the Autonomous System-padding, the asserted-routes-timeout, and the min-required-measurements options. All worked as advertised.

The penalty value is used as a bias to control link selection. The higher the penalty, the less likely a route will be preferred. Autonomous System-padding adds private Autonomous System numbers to the Autonomous System-path to make the asserted route unattractive to other ISPs in case it is accidentally advertised. The asserted-routes-timeout values define how long PathControl will leave an asserted route in the Internet router if no measurable traffic has been received. The min-required-measurements determines how many HRTT measurements should be taken before a route is asserted.

Other untested options include the ability to change the outage control, flap-control and metric change threshold.

Overall our tests showed that PathControl can assist in monitoring, controlling and optimizing Internet connections. It also provides a reliable mechanism for configuring preferred routes based on latency measurements and user configurable parameters. The increase in egress routing performance by PathControl can provide a definite return on investment.

Goddard and Vaughn are network engineers at the University of Florida. They can be reached at ggoddard@ufl.edu and rwvaughn@ufl.edu.

Net Results

PathControl

WORLD
CLASS
WINNER

4.7
RATING

Company: RouteScience, (866) 817-6883, www.routescience.com
Cost: Pricing for the eight-slot version of this device starts at \$99,900. **Pros:** Increases egress routing performances; easy to use command-line interface; many BGP options. **Cons:** Not ideal for routing streaming media content.

What's the score?

PathControl

Performance 30%	4
Configuration/Management 30%	5
Features 30%	5
Installation/Documentation 10%	5
TOTAL SCORE	4.7

Individual category scores are based on a scale of 1 to 5. Percentages are the weight given each category in determining the total score. ■ **Scoring Key:** 5: Exceptional showing in this category. Defines the standard of excellence. 4: Very good showing. Although there may be room for improvement, this product was much better than the average. 3: Average showing in this category. Product was neither especially good nor exceptionally bad. 2: Below average. Lacked some features or lower performance than other products or than expected. 1: Consistently subpar, or lacking features being reviewed.

TESTER'S
CHOICE
Barry Nance



Vendor installation can be a costly favor

So the salesman tells you that once you buy the software, his engineers will come on-site and handle the installation, as it's standard practice for all customers. At first blush, you think you're saving time, effort and money when you

take a software vendor up on its offer to sow its product across your network.

In reality, you're risking your network's reliability when you nod your head in assent and tell the vendor to schedule system engineer visits to your sites. When the sys-

tem engineers finish the installation, you become responsible for reinstalling the product when hardware failures crop up.

Likely very late on a Friday night, a network adapter card fails in one of your servers. The troubleshooter called in to fix the problem decides to replace the failed adapter or shift the computing workload to a spare computer. In either case, the troubleshooter spends the rest of the night and part of the next day putting the computer back to work.

If the troubleshooter decides to shift the workload to a spare computer, the first problem occurs when the documentation doesn't adequately describe the necessary steps to fire up the software. The system engineer who performed the original installation might have taken some shortcuts or might have put files into different directories to avoid disk space problems. But those moves aren't noted anywhere.

Whether your troubleshooter replaces the failed network adapter or switches to a spare computer, a license key error is surely the next roadblock. Intended to thwart software piracy, license key schemes tie the software to a specific media access control address, IP address, digital certificate or parallel port hardware device. On-call troubleshooters get to drink lots of coffee while third-shift vendor support people try to generate new license keys.

When we evaluate network software in the lab, we resist vendor installation. Because vendors love to take time during the installation process to give pep talks about the product's features, those vendors of otherwise superior products that don't send system engineers to perform the installation are at an unfair disadvantage. We want to experience the installation procedure to discover how modular the product is and how difficult that procedure is. Moreover, we almost always install the product on different computers to see how it behaves in different computing environments, and that second or third installation may very well take place late on a Friday night. Fortunately, when they learn about these subsequent unscheduled installations, most vendors forego sending the system engineer and just ship us the software.

When a vendor says your software purchase includes installation, avoid the temptation to say, "Just let me know when it's finished." Make sure you oversee the installation procedure, and plan to carry out a fire drill to ensure you can reinstall the product when necessary. Under no circumstances should you let the vendor's system engineer leave your office before your staff clearly understands the procedure for generating new license keys or otherwise getting the software back up to speed if a network adapter or entire computer fails late on a Friday night.

Nance, a software developer and consultant for 29 years, is the author of *Introduction to Networking, 4th Edition* and *Client/Server LAN Programming*. He can be reached at barryn@erols.com.

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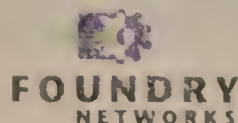
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How safe is your data center?

Follow these tips to prevent your IT staffers from being injured.

■ BY LINDA LEUNG

Imagine being in a dark room with a ceiling less than 5 feet high. A maze of network cables, electrical outlets and power conduits covers the floor, and steel posts run every two feet. You're crouched down or crawling on your hands and knees, and your back aches from trying to avoid hitting your head or smashing into the posts. Fast air currents are blowing on you from any number of directions.

Sounds like a nightmare? It's a reality for some IT professionals who work at a data center visited by Rob Snevely, a data center design expert with Sun. When Snevely asked why the floor was raised so high from the ground, he was told it gave workers enough space to crawl underneath and locate troublesome cables. "I consider having to work in an environment like that hazardous," he says.

Have you ever tripped over an old and buckled floor tile? Ever stepped into a hole where a floor tile had been lifted up? Here are some tips for avoiding possible data center mishaps.

Fire prevention

Snevely says common sources of fires in data centers are electrical systems or hardware. However, he says, "It is far more likely that very bad practices are the causes of the fires. There have been examples where people were smoking in a data center — never, ever do this.

"I know of one example where highly combustible chemicals were stored in the data center, as someone thought it was the most secure, and therefore safest, room in the building," he says.

In addition to having a no-smoking policy, keeping aisles clear and checking that ventilation systems are debris-free, companies should comply with the National Fire Protection Association (NFPA) 75 stan-

dard for the protection of electronic computer/data processing equipment, plus the general NFPA 1 fire protection code 2000.

NFPA 75 defines the use of fire detection systems and extinguishers in computer rooms and offers guidance on topics such as disaster response plans; heating, ventilation and air conditioning (HVAC) systems; and requirements for raised floors. But it's important to note that each jurisdiction differs in its interpretation of the codes, so you should check with your building authorities on how to adopt these standards.

Sun has a 10,000-square-foot

engineering data center in Palo Alto, where performance tests are carried out. The local authorities there dictate that Sun should not solely depend on its FM200 gas-based fire suppressant system, so the company also has installed a sprinkler system.

FM200 should be kept in canisters in the mechanical room ready

data centers should be 72 degrees Fahrenheit with humidity at 45%. If the air is too dry, the risk of electrostatic discharge is increased, and if it's too moist, there's the risk of erosion of the equipment.

Keep an aisle of 32 inches between rows of systems, with each row measuring 12 to 16 feet wide, to use as emergency exits.

To prevent floor tiles from buckling under the weight of computer systems, try using cast aluminum tiles that can handle weight of 1,750 pounds, even when perforated.

When lifting floor tiles, always use lifting devices, such as those with two suction cups, and not your fingernails. If you have to leave parts of the floor uncovered, use cones to mark clearly the area that is open.

Consider seismic bracing for equipment and shelving if your data center is located in an at-risk area, particularly if your data center is above the first floor.

When the 6.9 magnitude Loma Prieta earthquake struck California in 1989, Snevely was working in a building in Palo Alto, 45 miles away from the epicenter near Santa Cruz. Computers on the first floor moved a few feet, but the machines on the fifth floor moved 20 feet.

Working conditions

Snevely says it is best to have at least two trained first-aid personnel during each shift, so if one is injured, the other is on hand to help in emergencies. "It is a good idea to have a first-aid kit either in the staging area [usually a room adjacent to the data center] or control center," he says.

Noise in data centers shouldn't present a huge problem for employees if the sound is lower than 85 decibels. If the continuous noise level is higher, the U.S. Occupational Safety and Health Administration requires that ear protection be worn. Individual states may have stricter requirements.

You can reduce noise by keeping mechanical equipment, such as HVAC units, in a separate room, and by building walls sound-absorbent materials.

Finally, Snevely has some advice for companies that like to send data center personnel underneath raised floors to locate troublesome cables — "color-code both ends of cables so they are easier to locate." ■



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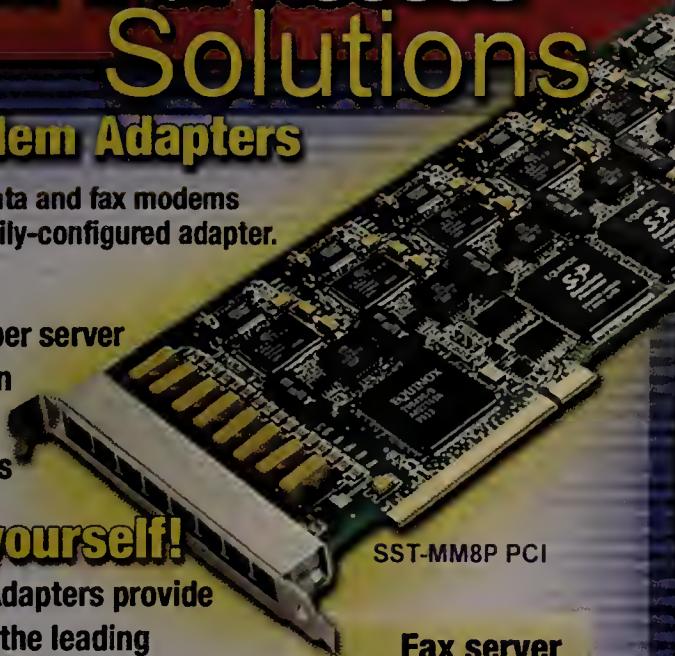
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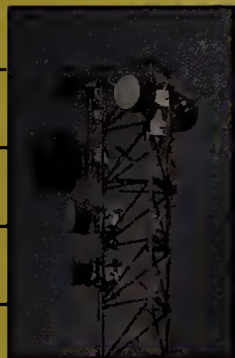
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```
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Connection to onella.
Escape character is '^]'.

PORT AND ACCESS SETUP MENU

1) Change first TCP/IP port [1024]
2) Change first TCP/IP port [1024]
3) Change first TCP/IP port [1024]
4) Change first TCP/IP port [1024]
5) Quit

[ NOTE: You currently have unsaved modifications ]
Enter an action (1/2/3/4/5) [5]:
```

Traditional Terminal Server

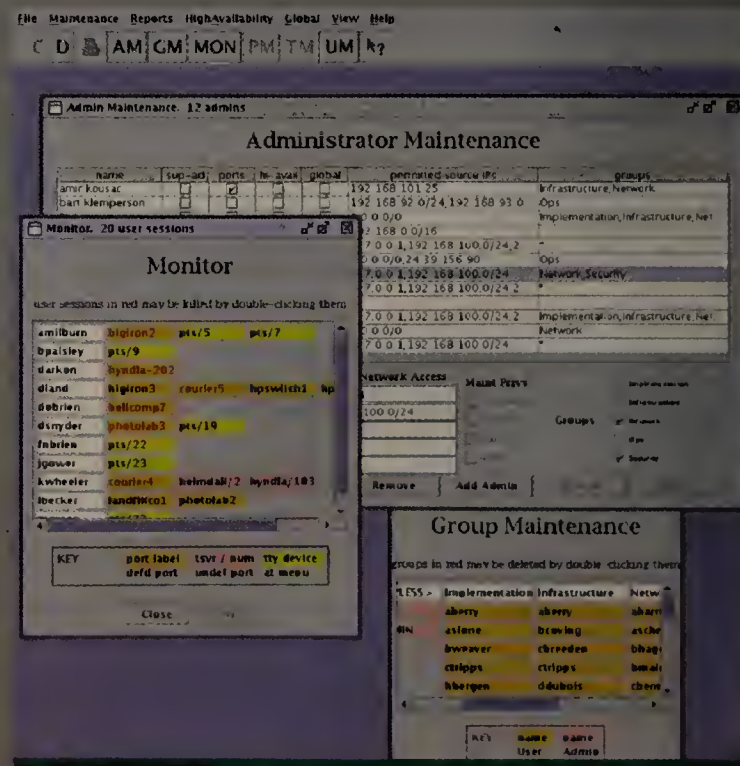
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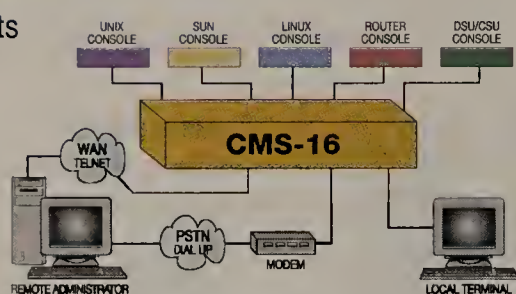
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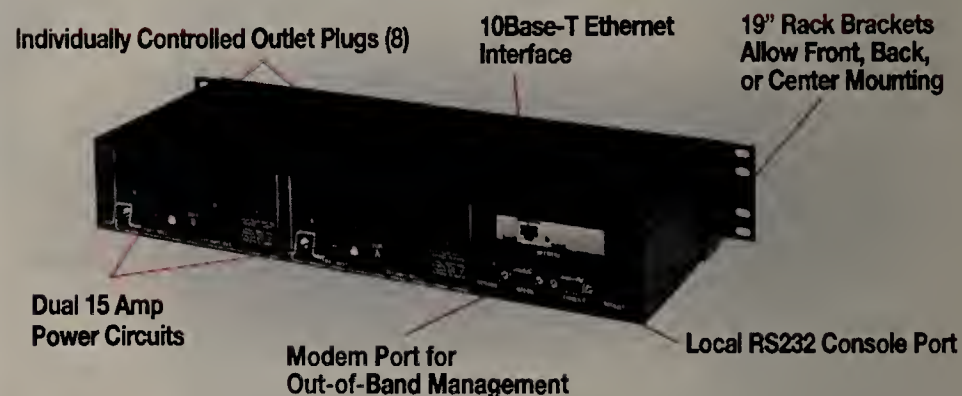


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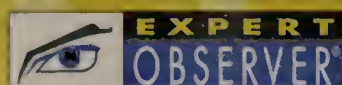
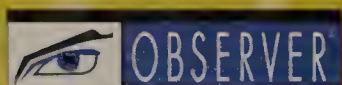
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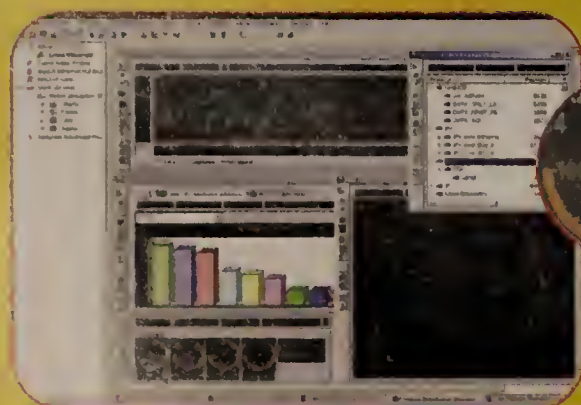
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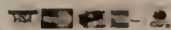
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Resume and/or cover letter must reflect each requirement above and specify reference code MIS-SA or it will be rejected.

Forward resume to Robbin Drew Elliott, Pitney Bowes Inc., One Elmcroft Road, Stamford, CT 06926-0700.

F/T Intermediate Unix Systems Administrator. Responsible for administering & supporting multiple SUN UNIX systems for co.'s corporate data centers. Analyze system bottlenecks, monitor & tune system(s) performance, basic shell scripting, troubleshoot defects found as well as deploy, install & configure hardware, operating & control systems, system security & recovery services. Work w/ SUN Solaris, SUN Enterprise Servers, TCP/IP, NFS, NIS & DNS. Must have Bachelor's degree in CS, Applied Statistics or related field. Foreign degree equivalent accepted. Employer will accept Master's degree in lieu of Bachelor's. Must have 8 yrs. exp. in job offered or position w/ same duties. Send resume: Mary Pita, HR, R2C-022, Job Code: IMTCW, UPS, P.O. Box 833, Mahwah, NJ 07430 or mpita@ups.com.

ZEN & ART

Software Development Co. in Iselin, NJ seeks to fill multiple openings for

Project Managers

Develop Project documentation in line with the GIS Management methodology. Implement project in specified time, cost and quality. Ability to plan direct, allocate and manage staff to execute project successfully. Well versed in budgeting, HR, Scope Management and Business Case Justification. Knowledgeable in MS Project and PM tool

Database Administrator

Design, create, install, configure, tune, maintain and recovering large databases (Oracle, Sybase, Informix, IBM DB/2) on UNIX/NT. Knowledge of Oracle Enterprise Manager, Forms, Reports, Erwin, Replication, Oracle Parallel Server and Distributed database

System Administrator

UNIX Sys Admin with technical expertise in an IBM AIX, Sun Solaris, HP-Unix, Linux environment, support RAID and Mass Storage (SAN) products. Also experience with AIX/Veritas, disk mirroring, thorough knowledge of UNIX Shell Script, performance monitoring utilities, back up utilities, and kernel modifications

Management Systems Analyst & System Analyst

Senior Programmer/Analyst independently performs all phases of systems development, including development planning, requirement analysis, database design and coding, testing, implementation, and documentation of applications. Act as a technical consultant to team members in the area of expertise such as Web E-Commerce, VOIP, WAP, TCP/IP and Security

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The Programmer/Analyst will analyze, design, detail specification document, code, test, and debug application programs using any/multiple programming language and development environment. C, C++, VC++, Pro*C, VB, VBScript, Java, Java Script, Enterprise Java Bean, Applets / Servlets, Java Web Server, Web Sphere, Web Logic, Lotus, Lotus Notes, Active X, COM/DCOM, Active Server Pages, PERL, HTML, DHTML, XML, FrontPage, SAP SD Functional, ABAP Programming, Powerbuilder, PTC, SAP, Peoplesoft, Oracle Financial, Oracle APPS, Designer 2K and Developer 2K

All positions except Tech Specialists/Programmers require: Masters or equiv OR Bachelors or equiv in Maths, Science, Engg, Bus. Admin. or Commerce with 6 months to 6 years of hands-on working experience. Tech Specialists/Programmers require 2 or more years hands-on working experience.

Candidates must be willing to travel and be a good team player. Must be able to work well without close supervision.

Respond by resume to: HR Dept, Zen & Art of Client Server Computing, Inc. 485 E, Rt 1 South, Ste 130, Iselin, NJ 08830. Fax 732 404-0623 or email: currentopenings@zenart.com.

Software Developer (multiple positions, Low Country, SC) to design, develop, code and test CAD applications in Linux, Unix and Windows operating systems by using the following skills/tools extensively: C/C++, XML, ActiveX Controls, Windows Sockets, 2D/3D graphic technique, Micro Station, AutoCAD, Pro-Engineer and Ideas, Parametric Modeling/ Programming, CAD database development/customization and Internet. Must have Master degree in CS, CIS or Engineering or related fields; Proficiency in Auto CAD, and Parametric Modeling/ Programming; \$45K-60K/yr., 40 hrs/wk, 9-5. Send resumes to Ms. Katie Crawford, DataBuilt, Inc. 1476 Fording Island Rd, Bluffton, SC 29910. Ref. Code: SC-YZ2.

Staff Engineer - AMEC Technologies, a global engineering, design and technology service firm currently seeks applicants for the following position in its Decatur, GA office: Staff Engineer to develop mathematical simulation algorithms and models; communication objects and protocols using OLE for Process Control (OPC) interfaces and TCP/IP. Applicants for this position must have a master's degree in Electrical Engineering, Computer Science or related field plus 5 years of job experience in development of models for simulation of pressure/flow processes in industrial systems using mathematical methods for computer simulation and object-oriented programming languages in multi-system environment and in development of OPC servers and configuration of network communication protocols based on TCP/IP. For consideration, please forward your resume to: AMEC Technologies, Inc. Attention, Mary A. Trizzino, 125 Clairemont Ave., Suite 570, Decatur, GA 30030. EOE

Senior Systems Engineer
needed at Brown & Williamson Tobacco Corporation in Macon, GA. Duties: Provide application and technical support for assigned area and applications. Experience using structured project management methodology, documentation, and time management software. Maintain good working relationships across departments within Information Technology (IT) and with client areas. Analyze enhancement requests, design, code and test enhancements and provide effective technical troubleshooting. Work on special projects including managing projects with external vendors. Technical skills required include development experience using client server tools such as PowerBuilder, VisualBasic, Oracle Tools, and C++. Must have strong understanding of Oracle and Informix relational databases and strong PL/SOL programming experience. Must have database and application design experience, as well as Unix and/or Windows NT experience and an understanding of IP and Novell networks. Requires experience in laboratory automation, Laboratory Information Management Systems (LIMS), Chromatography and instrumentation interfacing. Experience in laboratory system validation in accordance with ISO 25 Accreditation.

Must possess a Bachelor's degree in Computer Science, Engineering, Chemistry, or related discipline. Requires 5 years of experience as a Computer Programmer or Analyst. Send resume, including salary requirements to: Melissa Harden at 401 S. 4th Avenue, Ste. 200, Louisville, KY 40202-3426. Resumes without salary requirements will not be considered. No calls, faxes, or emails please! Equal Opportunity Employer

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Senior Programmer Analyst - Prime Software, Inc. a developer of client-server and Internet-based business application software currently seeks applicants for the following position in its Lisle, Illinois office: Senior Programmer Analyst. Applicants for this position must have a bachelor's degree in MIS, Engineering or related field plus 5 years of relevant experience in systems, application and program development using Powerbuilder, complex database programming in MS Sql Server, Sybase database. Web development experience in J2EE complaint Application Servers and JAVA would be required. Experience in working with full cycle projects conforming to SE1-CMM standards would be an advantage. For consideration, please forward resume to: Prime Software, Inc. Attention: Steve Good, 5007 Lincoln Ave., Suite 205, Lisle, IL 60532. EOE

Sr. Programmer/Analyst-Business Applications (West Des Moines, IA)-Prepare appropriate documentation for assigned projects which includes detailed program specifications, codes, flow charts & other documentation. Analyze & design, system software, & participate in discussions & studies aimed at selection of strategic technology & software solutions. Req'd Master's Degree in Business Admin. or Engineering or Science or Computer Science & a min. of 1 yr exp. in the above job or as System Analyst, 40 hrs/wk, 9am-5pm. Please send cover ltr & resume to ADP Human Resources, MS2, P.O. Box 10394, Des Moines, IA 50306-0394 or fax to (515) 875-3009.

Computer Professionals w/exp to analyze, design, develop, install & upgrade client/server applic. HR, Benefits, Payroll modules using Oracle, Sybase, Peoplesoft, HRizon, SOL, SOR, Peoplecode, UNIX, FTP & Process Scheduler; should Interface to Mainframe & other systems. Send resumes to: Recruiter GITS, LLC, 7067 East Chestnut Hill St., Littleton, CO 80130. Email: recruiter@globalinfotechservices.net No in-person resumes/interviews, only respond by mail or e-mail.

Analyst/Programmer sought by a software sales and service company in Denver, CO to work in Mossville, IL & other unanticipated job sites in the US. Within a MIMS open enterprise environment, produce customer-specific software to enable clients to implement a MIMS system or to convert from a Legacy system to MIMS. Develop URS/FDD (user requirement statements/functional design documents) to allow for interface development between Legacy systems and MIMS. Work in both UNIX and Sun Solaris operating systems using Microfocus COBOL, COBOL I and II, and Reporting Definition Language (RDL) to assess customer requirements, outline projects to meet customer's requirements and analyze and perform work orders of high complexity. Requires 4 yrs. as a programmer/analyst; working knowledge of MIMS open enterprise system. 8am-5pm, M-F; \$75,000/yr. Respond by resume to James Shimada, Colorado Department of Labor & Employment, Employment & Training Division, Tower II, #400, 1515 Arapahoe, Denver, CO 80202, & refer to Job Order Number CO5015560.

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Programmer Analyst Design/implement healthcare apps with VB 5.0/6.0/NET, Access 97/2000, Com, Dcom, SOL Server 2000, Crystal Reports and health care processes including patient admission, state/federal mds, case mix, care planning, physician order, infection control, security systems, payor source/payor plans, mobile medical device apps, healthcare billing/accounting and medical data sharing systems with 3rd parties, and communication apps for health care workers. Prevailing wage. BS Comp. Sc. (or foreign equiv.) with 2 yrs exp. including 1 yr. exp. in developing above specified applications using above tools. Respond to Geoff Marsh, Horizon Healthcare Technologies, 12101 Woodcrest Executive Drive, Suite 201, St. Louis, MO-63141. EOE.

Programmer Analyst at our Cedar Rapids, Iowa location. Convert customer requirements into program specifications; analyze impact of proposed solutions on business applications; ensure satisfactory functioning through testing and analysis of results; correct deficiencies according to customer requirements; and review work of development team members. Must have Bachelor's degree in Computer Science or related, three years experience with Object Oriented programming, SOL, Oracle, UNIX, and Windows application development; one year experience with programming in C; and Six months experience with JavaScript. Send resume with cover letter to APAC Customer Services, Inc., Attn: Cindy Corkery, 6 Parkway North Center, Deerfield, IL 60015.

Infomatics Technologies, Inc. delivers IT solutions to business clients nationwide; which involves frequent traveling and relocating. We have immed, full-time entry level & experienced programmers, Programmer Analysts, Systems Analyst, Software Engineers, DBAs & Software Consultants in any of the following skill sets: BPCS, AS/SET, AS/400, RPG/ILE, RPG III, COBOL/400, (CLP, SOL, QUERY/400), DB2/400, RPG S/36, Oracle, PL/SOL, C/C++, Unix, Windows NT, Bachelor's or Master's degree req'd depending on position. We also accept foreign educ equiv of degree or degree equiv in educ & exp, excellent benefits. Send confidential resume & salary rqmts to: The Human Resources, Infomatics Technologies, Inc. 35643 Ravine Circle, Farmington Hills, MI 48335

Programmer Analyst "Web enable" mainframe apps. to facilitate EDI using Websphere, Cold Fusion, ASP, Apache & related Web Servers, Cobol, DB2, CICS, VB, C, Java & related tools, Oracle, SOL Server, CSS, XML and XSL and Peregrine. Employer is a consulting company and position requires travel. Prevailing wage/benefit. Respond to: Attention: Guy New, Jolig Consulting, Inc., 1311 Buckingham Place, Richardson, TX 75081. EOE.

SOFTWARE ENGINEER wanted by consulting & software development firm in Sugar Land, TX. Respond by resume to: Recruiter, S/B #10, Digital Consulting and Software Services, One Sugar Creek Blvd., Ste 500, Sugar Land, TX 77478.

Senior Systems analysts, Programmers, Systems Analysts, with strong technical skills. Travel may be required throughout USA. Resumes to Leverage Systems Technologies, USA by Fax 714-596-7463 or email resumes to cheauser@LST-USA.com.

Programmer/Analyst. Dsgn & dvlp ETL modules; dsgn batch routines; perform data warehousing duties; performance tune modules; analyze specs & dvlp source code; test applics. BS in Comp Sci, Engg, or rel field. 3 yrs related industry exp, incl 2 yrs exp in dsgn & dvlpmt of ETL process using PL/SOL, Informatica Mappings, & Shell Scripting; & 2 yrs exp in data warehousing. Certified Oracle Prof'l DBA req'd. Send resume to Mike Davidson, Quality Consulting, Inc., 1500 NW 118th St., Des Moines, IA 50325.

NW OH Metal Dist. Co. seeks Network Administrator to coordinate installation of computer operating system software; test/maintain/modify software; troubleshoot, analyze performance indicators; review computer system capabilities; assist user having problems with system; and monitor computer programs. Min req. Bachelor's Degree in Mechanical Eng. or computer related field or equiv. and 3 mos. in job or job related exp to include use of Visual Basic, MS-Access, SCO Unix, Microsoft Office, MAS 90/200, Photoshop and Adobe GoLive. resumes to: All Folls, Inc. 4597 Van Epps Rd. Brooklyn Hts., OH 44131. No calls. EOE

Sr. Systems Consultant. Develop & implement computer apps./systems/networks, using UNIX and other tools. Analyze performance for Multi-CPU class servers. Develop & implement apps. for vulnerability assessment & mitigation. Masters degree in C.S., Math, Eng'g, or similar major/equiv., req'd, as is 5 yrs exp. as a Sr. Sys. Consultant or a sys. S/ware Eng'g or Comp. Sys. Admin. position. Prior exp. must include exp. w/UNIX, using Multi-CPU servers, & w/vulnerability assessment & mitigation. Competitive salary. Resumes to: Brian T. Hunt, Job #1494.08, American Trans Air, Inc., 7337 W. Washington St., Indianapolis, IN 46251-0609.

JD Edwards One World XE applications and integration developers at varied levels needed to staff multiple positions. Requires 2 years experience in application development which includes 1 or more years experience in JD Edwards One World Development. Send resumes to: Sara Lee Foods c/o Bridget Lindsay, 10151 Carver Rd., Cincinnati, OH 45242. Refer to job code: BDBC.

Applications Programmer for NE OH to plan, develop, test and document computer programs and maintain application-based programs designed to automate and streamline specific functions of the Accounts Receivable process using Visual Basic, Visual C++, MS Access. Utilize PC-based technology to interact with external software applications. Must have Bachelor's Degree or equivalent. Min. 3-month in-job exp. Resumes to: DD6-11, 10900 Carnegie Ave. Cleveland, OH 44195. No Calls.

InterOne Marketing is looking for computer programmers/analysts. Applicants must have BS degree with at least one-yr exp. using Oracle Designer/Developer/ Applications, Siebel, Unix, SDLC, AS/400, ILE-RPG, Sequel, DB2/400. Send resumes to 880 W. Long Lake, Troy, MI 48098

Software Associates has immediate openings for System Analyst and other IT professionals. Experience with Oracle, VB, C/C++, People Tools, SOR is a plus. Please send resumes to 3318 Fores Ave., Des Moines, IA 50311. EOE.

IT Developer 3, Educaid, Sacramento, CA. Assist w/ design of tech. solutions, create detailed tech. design documentation. Work directly w/ the FFELP student lending industry. Pos. reqs. 4 yrs exp. w/ Progress (3 yrs of the reqd. exp. must incl. Progress Database 7.3 or greater.) 2 yrs of the reqd. exp. must incl. developing software for UNIX Operat. System. 1 yr of reqd. exp. must incl. work w/ Progress Webspeed, SOL dvlp. & developing software for the FFELP student lending industry. 40hrs/wk, M-F, Send resume & cvr. letter to Ken Holtz, 3301 C Street, Sacramento, CA 95816.

ENGINEERING: Betasphere has opening for Director of Core Technology. MS + 3 yrs exp reqd. Exp with XML, Java, ERP and ASP reqd. Resume to: BetaSphere, 1135 San Antonio Rd, Palo Alto, CA 94303 Email: jobs@betasphere.com.

Compsoft Technology Solutions Group, Inc. seeks experienced Programmer Analysts, DBAs and Software Engineers to develop and design software systems using some of the following: C, C++, VB, Oracle, Developer 2000, Java, PL/SOL, MS Access, MS SOL, internet/wireless technologies, Windows /UNIX admin for Data warehousing etc. Require BS/MS or foreign equiv. Highly competitive salaries, some travel and relocation to client sites involved. Send Resumes to: 11 N Roselle Road, Schaumburg, IL 60194

ARINC, a leading provider of communications, information technology & system engineering, has an opening for a Systems Analyst at their office in Marina Del Rey, CA. The individual will assist a Senior Software Engineer in analyzing existing computer systems as it relates to the configuration management tools and Problem Tracking System. Individual must have a Bachelor's degree in Computer Science, Management Information Systems or closely related field. For consideration, fax your resume to: (978) 649-7078. Attn: Dept IHR-WS. EOE

Semafor Technologies has multiple openings for S/W Engineers, Prog/Sys Analysts, DBAs, Proj Mgrs and Sys Admins to design/develop/administer software applications using various development tools, languages, database/internet/wireless technologies on windows and UNIX platforms. Customize commercial business application. All positions require BS/MS or foreign equiv in Comp Sci, Math, Business, Sciences, Engg (any branch) or related field. Highly competitive salaries & benefits. Travel/relocation req. Resumes to: HR, 3300 Holcomb Bridge Rd, Ste 212, Norcross, GA 30092

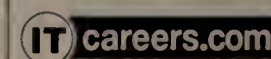
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Large healthcare organizations are growing information technology organizations, larger than many companies. With IT employees numbering in the thousands, the healthcare groups are turning to IT professionals to develop new tools to assist physicians

and healthcare professionals, improve the quality of record-keeping and availability, and automate processes that reach millions of healthcare users each day.

Among those leading the way with IT professionals is **Kaiser Permanente IT Division**, headquartered in Oakland, CA. With more than 4,000 IT employees, the **Kaiser Permanente IT Division** supports a nationwide health network and data centers designed to assist the healthcare organization's 80,000 employees and more than 8.1 million members receiving health care.

Michael Winkler, staffing marketing manager for **KP-IT**, said the division continues to implement the Clinical Information System, an effort to automate and make available online the reams of paper and images used to keep track of a patient's health and treatment. "Our goal is to get the records of a patient in the hands of doctors as quickly as possible," Winkler explains. The applications system management group is now developing Radiology Information Systems, a similar initiative to deal with radiological data and images.

KP-IT also recently announced the formation of its Internet Services Division. The organization combines **KP Online**, **kp.org** and **eHealthPlan** into a single unit. Internet Services will continue to develop web applications, streamline processes for getting online services to those who use them and organize services according to the way the user thinks, not the way **KP** is organized. A beta launch for members is planned for December with a full launch expected in spring 2003.

Winkler says **Kaiser Permanente** hires IT professionals, ranging from project managers and devel-

opers to senior healthcare IT experts. Opportunities exist wherever **KP** operates, but IT operations are largest in the Pasadena and Oakland areas. The healthcare provider looks for web-based development skills, database administration and design, network engineers and service and development on the backside of the business.

"Whatever the IT job is at **KP**, you'll continue to grow in your field," Winkler adds. "We have multiple projects in development, offering growth and learning. You'll be able to get your hands on a lot of different technologies. We aren't just maintaining systems; we're creating them. Our end result, in IT, is revolutionizing the way health care is delivered, that **KP-IT** is part of the healthcare team, delivering quality care to **Kaiser Permanente** members."



For more job opportunities with healthcare firms, turn to the pages of **ITcareers**.

- If you'd like to take part in an upcoming **ITcareers** feature, contact Janis Crowley, 650.312.0607 or janis_crowley@itcareers.net.
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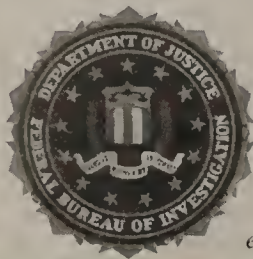
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Lead efforts in the design and development of data warehouse. Ensure proper and adequate management of information infrastructure including SQL Administration and database modeling.
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Lead data design, database architecture, metadata and repository creation efforts.
Prepare activity and progress reports regarding database management.
Ensure quality control of the data warehouse process.
Responsible that the integrity, availability and usability of the data warehouse.

Requires:
Prefer 3 years supervisory or project lead experience.
Data warehousing implementation experience - full life cycle
Strong knowledge of data warehousing concepts and best practices.
Business Intelligence experience with ad hoc query, reporting, and OLAP tools.
Demonstrated experience in database design - relational databases (Oracle, MS Access), and SQL.
Strong oral and written communication skills.
Bachelor's degree in MIS or Computer Science related field. Experience and/or certification can be substituted for a Bachelor's degree.

PeaceHealth offers a collaborative working environment with excellent benefits/compensation package. Please visit our web site at www.peacehealth.org to learn more about PeaceHealth. Send resume to:
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SignalTree Solutions is an established international IT solutions and services company. We provide our employees with a competitive compensation package and an excellent benefits package.

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Sr. Software Engineer II
Project Manager
Project Leader I
Project Leader II
Technical Architect

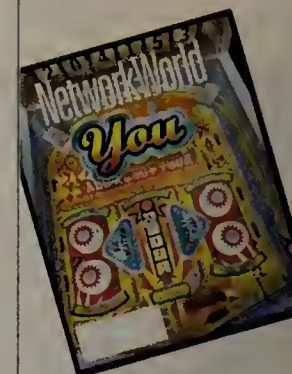
Please send a letter of introduction (indicating position of interest) along with resume, salary history and requirements to:

SignalTree Solutions,
Attn: L. Bardakjian,
CW730,
133 Technology Drive,
Suite 200,
Irvine, CA 92618.
Fax: (949) 450-4658.

Email: lb.resume@SignalTreeSolutions.com
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Web services

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rather have a service that says you give me a word and I'll send you back the definition?"

Currently, distributors get catalog information from Eastman in many ways, such as by visiting the company's Web site and copying data, by "screen scraping" the Web site or by having Eastman e-mail them files. However, because the catalog is updated regularly

but never on a scheduled basis, distributors often are left with dated information.

Using Web services, Eastman has created a way for distributors to access its product catalog and for them to push that access to their customers so everyone sees the same catalog in real time. Without Web services, every partner in the chain would have needed an identical application-integration server to gain such access, and Pleasant says that wouldn't have been practical.

"It doesn't take much technology just to consume our Web service," he says.

Eastman's partners are supplied with lightweight code that sits on their intranet servers and lets

them send catalog requests via messages based on Simple Object Access Protocol (SOAP), an XML protocol. SOAP creates a standard interface to activate the Microsoft Component Object Model Plus (COM+) interfaces used in Eastman's catalog application, called Saqqara. The COM+ interfaces remain on the Saqqara application server but are accessed through SOAP interfaces running on Eastman's WebMethods server, which provides a link to the Inter-

net. The WebMethods server creates the SOAP interfaces and generates the Web Service Description Language files, which describe the capabilities of the Web service. It all runs on Windows 2000 using a variety of dual and quad servers from Dell.

The catalog Web service includes four functions: It can return a list of products by family code or by category code, and return a technical data sheet for a specific product. The fourth function is the creation of an Extensible Stylesheet Language stylesheet for data presentation on the end user's side.

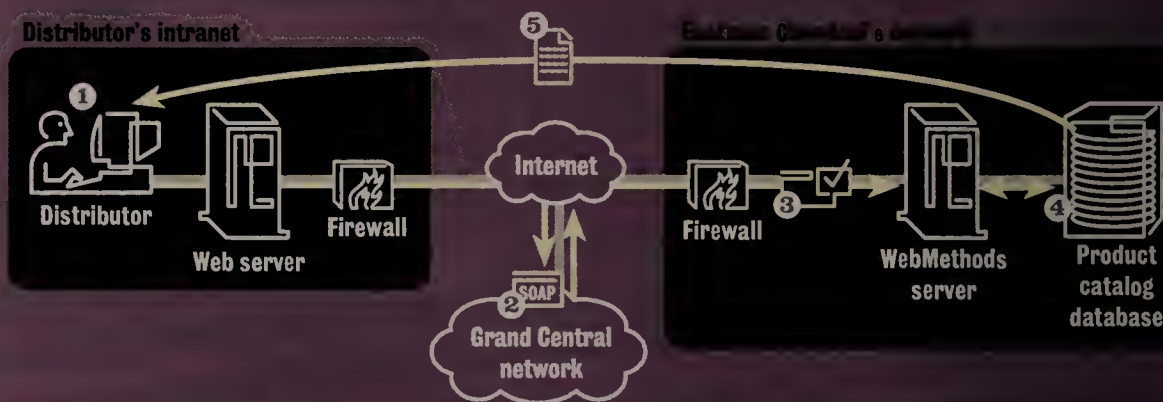
"We had these COM+ interfaces that you could call from inside the firewall using standard COM+

WebServices

First in a three-part series

Web services at work

Eastman Chemical is using Web services to give distributors access to more specific and up-to-date product catalog information than was possible previously.



1 A distributor requests information about a chemical listed in an Eastman Chemical product catalog.

2 The distributor's intranet server, which runs code supplied by Eastman, sends the request as a SOAP message over HTTP to service provider Grand Central's network.

3 Grand Central authenticates the end user, makes the connection to Eastman's WebMethods server and audits the connection.

4 Eastman's Web service for catalog access runs on the WebMethods server. The server accepts the SOAP message, which activates a COM+ interface that in turn requests the chemical information from the catalog database.

5 The requested information is delivered to the end user.

technology," Pleasant says. "But to open it up to our customers we had to be able to move outside of our firewall. And that is where Web services makes a big change."

Also key is that all those Web services components can be reused in other applications, something not possible with COM+, he says.

Programming flexibility also was a plus because Eastman has committed to Java for its Web-based environment but often uses Microsoft tools for internal application development. Pleasant used WebMethod's Java tool kit to create the Web services that call for the COM+ objects Eastman built using Microsoft's Visual Studio development tools.

While Pleasant is impressed by the potential of Web services, he's starting slowly because of the technology's limitations regarding security, transactional integrity and nonrepudiation.

So while Eastman will develop and run its own Web services, it is using a hosted middleware service from Grand Central Communications, which validates Web services users and logs their transactions. (Grand Central's service starts at \$150,000 per year, though the company has not yet determined the number of Web services or connections Eastman will use.)

Pleasant prefers for someone else to be responsible for authentication services because it is not an Eastman forte and it insulates the chemical company from the evolution of security standards and identity-management systems such as Micro-

soft's Passport and the Liberty Alliance Project started by Sun. Grand Central also provides authorization services that feature a Web-based application that Eastman uses to manage who has access to what and when on its network.

"We want Grand Central to take care of the volatility we expect to see around security," Pleasant says.

"We want them to worry about the maturation of the standards," he adds.

And there are other services that Pleasant needs.

"As you do more complex transactions, especially multi-party transactions, this business of keeping track of whose system said what and when is pretty im-

portant. Grand Central has those kinds of nonrepudiation services. When a transaction does break and you need to do a post-mortem, having an independent third party to do that is really, really important," he says.

While it's easy to get carried away with the potential of Web services, Pleasant says Eastman is right about where he'd like to see it in terms of adoption.

"One of the things that I keep telling people is we are not late to this party," he says. "We are fashionably early."

Next week: Web services on campus. ■

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Baan

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Baan's emphasis on developing e-business software for manufacturers just might save the company, experts say. Baan continues to grow and retain a loyal customer base that craves its expertise in discrete manufacturing, says Katherine Jones, managing director at Aberdeen Group. "They do that probably better than anybody."

Also enabling a comeback is that Laurens van der Tang, Baan's president since August 2000, kept his development group intact throughout Baan's corporate turmoil, Jones says. The group stayed together and continued to advance Baan's products. "They weren't asleep at the wheel, they were really just low profile," Jones says.

In time for the inForum conference, this development team pulled together two new product suites as well as hooks to third-party software suites. The new iBaan for PLM is entirely Web-based, and iBaan for SCM is a hybrid of client/server and Web-based modules.

Moving its applications to an Internet-based infrastructure is key to the company's strategy, but Baan lags behind its ERP competition in this area. SAP, PeopleSoft and Oracle already have shifted their applications from the client/server to the Web-based world. "If Baan is going to be a Tier-1 competitor, it needs to keep pace with what Tier-1 vendors are doing," says Kelly Spang, senior analyst at Current Analysis.

Leading up to the show, Baan delivered its new customer relationship management suite, iBaan for CRM. Early on, Baan was among the first ERP vendors to try to expand into CRM, buying CRM company Aurum in 1997. It was a visionary move, but Baan never did much with Aurum and fell behind other ERP vendors in its CRM execution, Spang says. "Organizational confusion cost Baan about a year in its CRM strategy," she says.

With iBaan for CRM, which was announced in January, Baan is trying to invigorate its CRM business. So far, Baan has the pieces but lacks the breadth of functions top-tier CRM vendors such as Siebel Systems and PeopleSoft have across sales, marketing and service, Spang says. ■

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Attacks

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a known attack," says Oliver Friedrichs, director of engineering at consultancy SecurityFocus.

"It does make it harder for IDS," says Stuart Staniford, president and founder of Silicon Defense, which this week announced Sentarus, a management console product line for sensors based on IDS freeware Snort.

Once a new attack is known, it usually takes the IDS vendors a number of hours or days to develop a signature. But in the case of ADMutate, it has taken months for signature-based IDS vendors to

add a way to detect a polymorphic buffer overflow generated by it.

"It's a hard problem," says Marty Roesch, president of Sourcefire, a company he founded to commercialize Snort, which he invented. "The idea is that signature-based IDSes like Snort look for traffic in a payload called Shell Code, but you can evade this with polymorphic shell-code generation."

Sourcefire, Internet Security Systems (ISS) and NFR Security are among the vendors that claim to have developed a defense for the ADMutate code-mutation exploit in their IDS products. "We were working on that one for

some time," says Chris Rouland, director of the X-Force at ISS.

Even if the vendors have found a way to counter ADMutate, which is not clear, Skoudis says, "There are so many ways to do the same thing as ADMutate. It shows the underlying flaws. We will see a proliferation of polymorphic techniques."

A British firm, NSS Group, in the next few months will evaluate more than a dozen of the latest IDS products to see if they can detect ADMutate-generated code, among other evasion techniques, such as Fragrouter and Whisker. Results should be released in June, says Bob Walder, director of

the NSS Group.

In December, NSS Group published more than 200 pages of lab tests it did on 16 IDS products. While the polymorphic buffer overflow might be the most dramatic way to sneak by an IDS, there are many other ways that involve hiding attack code inside large data flows directed at a target. Some IDSes, which depend on mirroring traffic, drop packets when traffic flows increase.

The ISS RealSecure product, Snort and Enterasys' Dragon product "all demonstrated some problems with handling detection on a network saturated with

64-byte packets, causing them to miss attacks under load," wrote NSS Group in its December report.

Cisco's Secure IDS Model 4320, NFR's NID 200 and BlackICE Sentry software (formerly sold by Network Ice, purchased by ISS last year) performed the best in detection, according to the NSS Group report. "Unfortunately, although it performed well under load, Symantec's NetProwler tended to misrepresent many of the attacks detected and was the only one of that group that was outwitted by our IDS evasion techniques," the report said. "Chargen attacks were reported as Stacheldraht, SYN floods were reported as ICMP Redirect, and SYNDrop was reported as the Tribal Flood Network 2K, among others."

And, according to NSS Group, another IDS, Intrusion's SecureNet Pro's sensor and console, were overwhelmed by an attack called Snot in which "genuine" attacks are inserted into a deliberate flood of data traffic.

RealSecure's detection capabilities fall off dramatically at 50% of network load, according to NSS Group. But ISS is redesigning its IDS to be based on BlackICE, which makes use of anomaly detection and can detect ADMutate-based attacks. RealSecure 7.0, expected to ship by June, should reflect such improvements.

ISS customers seem patient.

"There's nothing that is really perfect," says Andrew Bagrin, director of business technology at Regal Cinemas, which uses RealSecure to detect attacks against its Web site and internal network. "The RealSecure IDS does a good job for most attacks, and when it senses one, it sends a message to our Check Point firewall to block that attack traffic for 50 minutes."

Regal is merging with United Artist and Edward Theatres to form the Regal Entertainment Group, totaling 560 locations. At that point, Regal will deploy an appliance from Crossbeam Systems called the Crossbeam X403 to run the firewall and IDS on the same hardware.

NSS Group director Walder says the IDS industry is undergoing such rapid change that NSS Group will have to do tests at least two or three times per year to keep up with what vendors are doing to improve their products. ■

Industry group to define Web services

■ BY JOHN COX

MILPITAS, CALIF.—Work is now officially under way by the World Wide Web Consortium to hammer out a formal framework for Web services.

In its first face-to-face meeting last week, the recently formed W3C Web Services Architecture Working Group began crafting a paper that, among other things, will describe what Web services are, the technologies needed for them, how they'll interact with each other, and how to address privacy and security. The paper is due out by year-end.

Eventually, when approved by the W3C, the specified architecture could be adopted by vendors of development tools, application servers, databases and packaged applications. For enterprise network shops, this should translate into Web services that are easier to create and that can easily work together.

Last week, some 60 representatives from more than 40 vendors and corporations met in person after about two months of telephone conferences, which were designed to give the assembled working group a starting point for discussion.

Corporate members include Boeing, ChevronTexaco, DaimlerChrysler Research and Technology, and W.W. Grainger. Vendors include BEA Systems, Compaq, Contivo, IBM, Intel, Microsoft, SAP and Sun.

Initially, the group is defining a Web service as an application identified by a URL that has an interface that can be defined, found and used by XML-based objects, and that works directly with other similar applications

using XML-based messages over Internet protocols.

An array of W3C groups are addressing various Web services technologies, such as XML, the Web Services Definition Language and Simple Object Access Protocol, says Dave Hollander, CTO of data integration software maker Contivo and a member of the architecture group.

"This new group will let us define the architecture requirements for Web services so these other projects won't go out and create incompatible results," he says. "What's been happening until now is that we've been get-

ting the [Web services] transport layer stuff to the point where it's 'good enough.'"

Now attention can be focused on what's needed so that Web services don't simply connect to each other, but understand each other and work together in elaborate ways.

As the architecture draft is created, drawing heavily from work by other W3C groups, it will be fed back into these groups for review and comment.

That coordination, and the active participation of key vendors, could lead to product implementations by early 2003. ■

What's stopping you?

Limitations of current technology and standards were cited as the top technology-related obstacle to deploying Web services by 27% of 116 attendees surveyed at a Giga Information Group conference in December.

AT&T

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services. Aibinder declined to reveal which vendor's gear AT&T has deployed, citing security concerns.

One industry expert sees the moves as positive.

"It's a practical, important enhancement that allows more conservative users to keep their existing network environment while adding voice support," says Tom Jenkins, a vice president at consulting firm TeleChoice. "The ability to support any-to-any connectivity for voice and data allows users to evaluate the technology without migrating locations to an all-frame relay or all-IP environment."

But to support any-to-any voice traffic, companies need to order an additional permanent virtual circuit to AT&T's network hub, where its firewalls are deployed. This is an additional expense that companies would have to evaluate before making the switch, Jenkins says. A customer with an all-frame relay or all-ATM network would not need an additional permanent virtual circuit back to AT&T.

AT&T announced the offerings at the Spring 2002 Voice on the Net conference.

AT&T offers converged voice and data with its Managed Internet Service (MIS), Managed Data Network Services and Managed Router Service. The latter two offerings are for either ATM or frame relay networks. The carrier introduced its

fully managed combined voice and data features in January 2001 (see www.nwfusion.com, DocFinder: 8947).

Serv-A-Lite has used the AT&T MIS service to support its outbound calls since December. The wholesale hardware distributor is using four channels from its dedicated T-1 line to support the company's voice traffic.

"We saved \$3,000 the first month we deployed the service," says Bill Hintz, IT director at the East Moline, Ill., company. Hintz also points out that the service offers redundancy that the company didn't have before. "If my local carrier lops a line, we'll still have voice service," he says.

AT&T also has expanded its in-country off-net voice support. AT&T plans to have "dozens" of gateways deployed at the edge of its data networks and the public switched telephone network (PSTN) overseas by year-end. These gateways will allow faster call termination on the PSTN within countries where the calls are destined. Aibinder says these calls were sometimes back-hauled to the U.S., terminated on the domestic PSTN and sent overseas over AT&T's circuit switched network.

AT&T says it can support more in-country call termination because it is in the process of taking back some of its network assets that were part of the failed Concert deal. Concert was a joint venture between AT&T and British Telecom.

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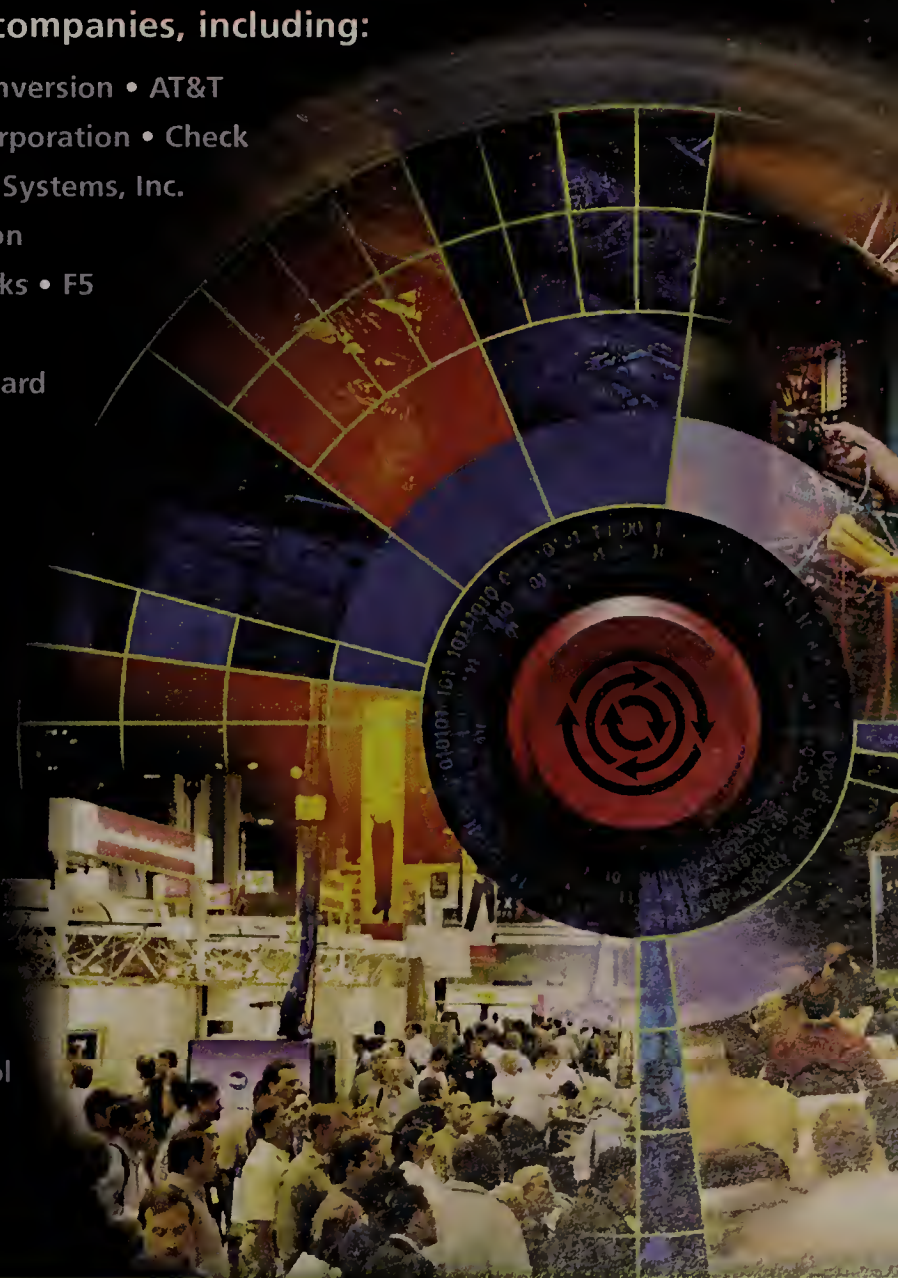
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AN INTEROP

BackSpin Mark Gibbs



Perfection by bots

"If there's so much labor-saving machinery, why don't I have more free time?"

— Anon.

Imagine a world that is connected by orders of magnitude more than at present. A world with perfect gardens where there are no slugs, snails, whitefly or weeds. Where no one owns a lawn mower. A world without vacuum cleaners. A world where network cabling is pulled and maintained automatically.

This is a world where useful robots really exist. Robots that are, for all intents and purposes, smart. And it's just around the corner. The dream of having an army of capable, practical robots to do our bidding appears to be getting closer to reality far faster than I expected.

What has me on this topic is the recent announcement by the Sony Digital Creatures Laboratory of the "SDR-4X" humanoid robot (see www.nwfusion.com, DocFinder: 8948). This thing is amazing. Walking on two legs, it is 20 inches tall, weighs in at 14.3 pounds and its body has 38 points of articulation, making it capable of complex physical movements. Those movements are

controlled by a sophisticated real-time adaptive motion-control system.

The SDR-4X also has a pair of digital cameras for stereoscopic vision so it can negotiate around objects. It can remember the faces of 10 people, recognize emotions from facial features, and understand continuous speech. Wow.

When it comes on the market sometime this year, the SDR-4X will cost about the same as a small car. But like the Sony robot dog, Aibo (www.us.aibo.com), the price of the SDR-4X will plummet with increasing sales.

And then there's the new 500-pound watchdog robot from Sanyo (see DocFinder: 8949) and the Slugbot from the Intelligent Autonomous Systems Laboratory of the University of the West of England (see DocFinder: 8950) — the commercial pressure to build useful bots is mounting.

So what will these devices be capable of doing? Labor. Silent, round-the-clock, good old-fashioned tireless labor. Armed with something like scissors, a small robot the size of Sony's SDR-4X could precision-cut your lawn. Just think, you will never see weeds again. And for that matter, you'll never see dead flowers because the bot will remove the flowers when they pass their peak.

And as the bot goes about its work it will kill any whitefly it finds, destroy slugs and apply fer-

tilizer. And that's just the garden! You'll never hear a vacuum cleaner again because the house bots will silently sweep and polish all night long.

We're going to have these robots everywhere — municipal bots sweeping streets and digging ditches silently. There'll be scores of housebots and officebots cleaning, sweeping, repairing and guarding. And all of these bots will communicate with each other.

Your bots will know all about you. And your neighbor's bots will know about your neighbors. And you'll want your bots to coordinate with your neighbors' and the municipal bots to keep all of the perfect yards perfect. We'll want to know that if there's an emergency our bots can get the message out via other bots. All of this means that the bots can and will "gossip."

The potential for surveillance will be vastly increased with so many smart devices running (literally) around.

I could fill several columns extrapolating the impact that robots could have on our culture and economy.

But there's one thing I still haven't figured out: Will I have more free time?

What do you want a bot for? Task lists to nwcolumn@gibbs.com.



'Net Buzz News, insights, opinions and oddities

Paul McNamara

A different type of buddy list

Whoever said you can't fight City Hall apparently never built a Web site.

However, he might have predicted at least some of what has gone down in Providence, R.I., after a band of fed-up citizens launched www.buddycianci.com, a site dedicated to bringing about the resignation of roguish Mayor Vincent A. (Buddy) Cianci Jr.

Among the skirmishes since the site was launched:

- Cianci has threatened legal action against the site operators for allegedly misappropriating his name and likeness.
- The mayor, who goes on trial this week to answer a 30-count racketeering indictment, has attempted to call attention to the purported unfairness of the site by registering domain names that match the first and last names of Providence journalists. Turnabout is fair play, or so says the mayor.
- And here's my favorite part: The site operators have made noise about a "mysterious" three day blockage of traffic to www.buddycianci.com — only traffic from the Providence area — that they suggest might have been the handiwork of a Cianci sympathizer with access to a Verizon router. (Cianci insists he can't even turn on a computer, and Verizon says the charge is nonsense.)

Those of you who live in the Northeast are probably shaking your heads and muttering, "Ah, Providence."

But the story is great theater, so here's how Buzz reviews these three acts:

- **Cianci** had better hope his criminal defense holds more water than the legal maneuver his lawyer tossed at the Webmaster of www.buddycianci.com. The mayor has a better chance of being elected cellblock president than getting any honest judge to pull the plug on his tormenters. The First Amendment protects nothing if not the free speech of this nature, and it's awfully hard to call the mayor a men-

ace without using his name and likeness.

- Nor does his honor appear to know much about journalists. Those members of the press whose personal domain names have been snapped up by the mayor are undoubtedly wearing their notoriety as a merit badge. Those who Cianci didn't see fit to target are just as certainly paying a price in lunchroom abuse.

- As for the routing intrigue, it's difficult for me to imagine that anyone at Verizon would put their job on the line to pull such a prank, even at the behest of a Napoleonic mayor who for decades has held sway over the biggest city in the smallest state. I just can't believe this was intentional. . . . Of course, it's worth noting that the Web site operators insist their access problem disappeared soon after they complained to Verizon.

Stranger things have happened . . . especially in Providence.

Roll-your-own DSL causes quite a stir

Last week's item about the Colorado neighborhood that gave up on Qwest Communications and decided to become a self-service DSL provider sparked an outpouring of interest after the column was flagged on www.slashdot.com. (You can read the Slashdot give-and-take at www.nwfusion.com, DocFinder: 8943.)

So many people were interested in learning more about the efforts of the Ruby Ranch Internet Cooperative Association that the organization's Web site — www.rric.net — was brought to its knees for a time.

Moreover, our own Network World Fusion site — www.nwfusion.com — experienced and withstood a record one-day traffic surge that our Web guys attributed in part to conspicuous interest in that roll-your-own-DSL coverage.

Note to entrepreneurs and venture capitalists: Seems there might be a business opportunity in helping the DSL-deprived take matters into their own hands.

Have something to say about this column? You could register www.paulmcnamara.com as a gesture of protest, but it would be much easier and cheaper to direct your e-mail to buzz@nww.com.

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